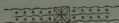


# ANNUAL REPORT



## Health Department



CITY OF NEWARK, N. J.

1894.

---

NEWARK, N. J :  
HEINZ LITHO. AND PRINTING CO.,  
293, 295, 297 Halsey Street,  
1895.

---

---

COMPLIMENTS OF

**CHARLES LEHLBACH,**

*MEDICAL OFFICER OF HEALTH,*

**NEWARK, N. J.**

---

---



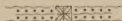
MAP  
OF  
THE CITY OF  
**NEWARK**  
STATE OF  
NEW JERSEY

Typhoid Fever and Wells.





# ANNUAL REPORT



## Health Department



CITY OF NEWARK, N. J.

1894.

---

NEWARK, N. J.:  
HEINZ LITHO. AND PRINTING CO.,  
191, 195, 197 Halsey Street,  
1895.



# INDEX.

---

|   | PAGE.           |
|---|-----------------|
| The Board of Health.....                                      | 3               |
| Standing Committees.....                                      | 4               |
| Employees .....   | 5               |
| District Physicians.....                                      | 6               |
| <i>Report of the Medical Officer of Health</i> .....          | 9-52            |
| Statistics.....   | 10-18           |
| Infectious Diseases.....                                      | 19-26 and 27-39 |
| Disinfecting Station.....                                     | 27-35           |
| Bacteriological Laboratory .....                              | 36              |
| Water Supply... ..  | 39-43           |
| Wells .....   | 43              |
| Chemical Analyses, Milk and Food Inspection... ..             | 45              |
| Cow Stables .....   | 46              |
| Plumbing Department.....                                      | 47              |
| Meat and Live Stock Department.....                           | 48              |
| Sanitary Inspections.....                                     | 49              |
| Dispensary and Out-door Poor Department.....                  | 51              |
| <i>Analysis of Mortality Statistics (by F. L. Hoffman)</i> .. | 53-60           |
| Financial Report.....   | 61-64           |
| Chemist's Report.....   | 65-74           |



## APPENDIX—TABLES :

|                                     | PAGE.   |
|-------------------------------------|---------|
| Births .....                        | 77      |
| Still Births .....                  | 77      |
| Marriages .....                     | 78      |
| Nativities .....                    | 79      |
| Deaths in Institutions .....        | 79      |
| Classification of Deaths .....      | 80-89   |
| Actual Mortality by Wards .....     | 91      |
| Wells—Recorded .....                | 92-112  |
| Wells—Analyses .....                | 114-120 |
| Cow Stables Recorded .....          | 121-125 |
| Meteorological Report .....         | 126-137 |
| “ “ Summary for 1894 .....          | 138     |
| Extent of Public Improvements ..... | 139     |
| Index .....                         | 143     |

## BOARD OF HEALTH.

—:0:—

|   |           |                  |
|---|-----------|------------------|
| F. B. MANDEVILLE, M. D., <i>President</i> , | - -       | 1021 Broad St    |
| MOSES STRAUS, <i>Treasurer</i> ,            | - - - - - | 1085 Broad St    |
| JOHN A. FURMAN,                             | - - - - - | 65 South 10th St |
| WILLIAM B. GUILD,                           | - - - - - | 3 Legrange Pl    |
| H. C. H. HEROLD, M. D.,                     | - - - - - | 75 Congress St   |
| ROBERT J. MARSHALL, M. D.,                  | - - -     | 82 Congress St   |
| JOHN B. STOBÆUS,                            | - - - - - | 173 Clifford St  |
| ROBERT B. SUTPHEN,                          | - - - - - | 257 South 8th St |
| D. L. WALLACE, M. D.,                       | - - - - - | 192 Clinton Ave  |
| C. M. ZEH, M. D.,                           | - - - - - | 481 Broad St     |

—:0:—

### MEDICAL OFFICER OF HEALTH,

|                               |     |                   |
|-------------------------------|-----|-------------------|
| CHARLES LEHLBACH, Jr., M. D., | - - | 24 Breintnall Pl. |
|-------------------------------|-----|-------------------|

# Standing Committees of the Board of Health,

FOR THE YEAR 1894.

---

## On Finance,

Moses Straus, R. B. Sutphen, John B. Stobaeus

## On Sanitation,

H. C. H. Herold, M. D., C. M. Zeh, M. D., William B. Guild,  
M. Straus, L. L. Marshall, M. D.

## On Laws and Ordinances,

William B. Guild, C. M. Zeh, M. D., R. J. Marshall, M. D.

## On Appointments,

Robert B. Sutphen, R. J. Marshall, M. D.,  
H. C. H. Herold, M. D.

## On Rules,

J. B. Stobaeus, D. L. Wallace, M. D., J. A. Furman

## On Supplies,

J. A. Furman, D. L. Wallace, M. D., R. B. Sutphen

## Committee on Newark City Hospital,

D. L. Wallace, M. D., H. C. H. Herold, M. D., Moses Straus  
J. A. Furman, J. B. Stobaeus

## Committee on Training School,

C. M. Zeh, M. D., F. B. Mandeville, M. D., *President*,  
D. L. Wallace, M. D., C. Young, M. D.,  
C. D. Bennett, M. D., C. F. Underwood, M. D.

## Employees of the Board of Health.

---

|  |   |   |                     |
|--|---|---|---------------------|
| D. D. CHANDLER, <i>Superintendent,</i> | - | - | 74 North 7th St     |
| HERBERT B. BALDWIN, <i>Chemist,</i>    | - | - | 215 Market St       |
| WILLIAM A. SMITH, <i>Apothecary</i>    | - | - | 7, Pennsylvania Ave |
| JOHN J. GREENE, <i>Clerk,</i>          | - | - | Warren St           |
| JOHN H. McDONALD, <i>Typewriter,</i>   | - | - | 158 Eighth Ave      |

### Meat Inspectors,

|                      |   |   |   |   |              |
|----------------------|---|---|---|---|--------------|
| WERNER RUNGE, V. S., | - | - | - | - | 130 Union St |
| CHARLES WOLZ,        | - | - | - | - | 31 Ferry St  |

### Plumbing Inspectors,

|                   |   |   |   |   |               |
|-------------------|---|---|---|---|---------------|
| J. B. SULLIVAN,   | - | - | - | - | 204 Second St |
| WILLIAM H. GRIER, | - | - | - | - | 37½ Third St  |

### Milk Inspector,

|                  |   |   |   |   |              |
|------------------|---|---|---|---|--------------|
| WILLIAM H. LYLE, | - | - | - | - | 63 Newton St |
|------------------|---|---|---|---|--------------|

### Sanitary Police,

\*Ball, John, 103 Johnson St  
 Brady, A. J., 70 Arlington St  
 Edwards, R. J., 514 Central Ave.  
 Newton, T. F., 32 Clifton Ave  
 \*Studer, D., 24 Bowery St  
 Seidl, M., 411 South 10th St.  
 Bellar, E. W., 45 Congress St  
 Bridgem, L. H., 59 Court St  
 Knott, Samuel, 34 Colden St  
 Rawding, W., 40 Essex St.  
 Young, William, 246 Norfolk St.  
 \*Wright, John, Arlington St  
 \*Freeman, Thos. E., 15 Orchard St

---

\*Detailed to Disinfecting Corps.

## DISTRICT PHYSICIANS.

— 0 —

- 1st DIST —DR L. A. ROFFMAN, No. — Ferry Street. District Lines—Haddon Place, Lafayette and Polk Streets, and Passaic River.
- 2d DIST —DR F. W. THUM, No. 149 Polk Street. District Lines—Haddon Place, Lafayette and Polk Streets, Passaic River, Railroad Place, Ferry, Union and Pacific Streets, and Avenue D.
- 3d DIST. —DR WM F SEIDLER, 21 Ferry Street. District Lines—Broad, Market, Ferry, Union and Pacific Streets, and Avenue D.
- 4th DIST —DR F. CONNELLY, No. 14 Polk Street. District Lines—High Street and Central Avenue, Centre Street, Passaic River, Railroad Place, Market, Broad Streets, LaGrange Place, Washington and Spruce Streets.
- 5th DIST —DR EMANUEL ISENBURG, cor. Springfield Ave. and High Street. District Lines—Hillside Avenue, Charlton Street, Spruce and Park Street, Richmond Street, Bank, High, Spruce and Washington Streets, LaGrange Place and Broad Street.
- 6th DIST —DR J. WILNER, No. — Belmont Avenue. District Lines—Fifteenth Avenue, Springfield Avenue, Charlton Street and Hillside Avenue.
- 7th DIST —DR A. NAGLER, No. 24 Broad Street. District Lines—Fifteenth Avenue, Springfield Avenue, Rankin, Richmond and Park Street, Wallace Place, Warren Street and Central Avenue.
- 8th DIST —DR. E. E. WORL, No. 295½ High Street. District Lines—High, Orange and Norfolk Streets, Central Avenue, Hudson Street, Wallace Place and Bank Street.
- 9th DIST —DR. E. EVERITT, No. 587 Warren Street. District Lines—Bloomfield and Clifton Avenues, Norfolk Street, Central Avenue, Hudson and Warren Streets and Central Avenue.
- 10th DIST. —DR E. ZEH HAWKES, No. 181 Broad Street. District Lines—Centre Street, Park Place, Broad Street, Central Avenue, High and Orange Streets, Clifton and Bloomfield Avenues and Passaic River.

ANNUAL REPORT  
OF THE  
Medical Officer of Health.



# ANNUAL REPORT

OF THE

## Medical Officer of Health.

---

NEWARK, N. J., December 31st, 1894.

*To the Board of Health of the City of Newark:*

GENTLEMEN. Herewith is submitted to you a report of the Health Department for the year ending December 31, 1894.

It is with satisfaction that I am able to present to you the report of a period marked by an advance in sanitation in Newark, notwithstanding the fact that much time was devoted to combatting an outbreak of smallpox, which at its onset threatened to become epidemic.

A study of the facts presented, together with an analysis of the mortality records, show that the good effects of sanitation and the enforcement of the ordinances of the Board have had the effect of lowering the death rate of the city and of placing Newark foremost in the ranks of those cities which have become recognized as progressive in sanitary matters. Especially is the comparatively low death rate to be commented upon when it is considered that according to the United States Census of 1890



we have more people employed in many and varied industries, all of which are more or less non-conducive to health, than any other city of the same total population, in this respect being even on a par with cities having a population far exceeding ours.

Naturally the gross death rate in a manufacturing city is high, and when it is below what may be justly expected, and the causes of damnation are found in those diseases and deaths which are in a large measure controllable by the enforcement of sanitary laws, there is reason to be satisfied.

As your Executive Officer, I have recommended, where it seemed expedient, certain changes, and I trust that they will receive your consideration, and, if in conformity with your views, your endorsement.

#### VITAL STATISTICS.

##### BIRTHS.

The total number of births reported was 5,194. Of these 5,096 were white, and 98 colored; 2,621 were males, and 2,561 were females, and in 12 the sex was not stated. 5,138 were legitimate, and 56 illegitimate. The birth rate per thousand of the population is 25.47, and exceeds the death rate for the year. (See table I.)

##### MARRIAGES.

There were recorded 1,630 marriages. This represents a rate of 7.94 per thousand, which must be considered below the actual rate. Neglect on the part of those, whose duty it is to report these facts, is the cause. (See table II.)

##### DEATHS.

There were recorded during the year 4,543 deaths, which represent a death rate of 22.28 per thousand of

the population. Of these 3,216 were native born and 1,309 foreign born, and in 18 cases the nativity was not stated. (See table III and table V, tabulated statement deaths.)

The social state of the decedents was as follows:

|                  |       |
|------------------|-------|
| Married .....    | 1,351 |
| Single. ....     | 2,569 |
| Widow. ....      | 375   |
| Widower ..       | 210   |
| Not stated ..... | 38    |
| Total. ....      | 4,543 |

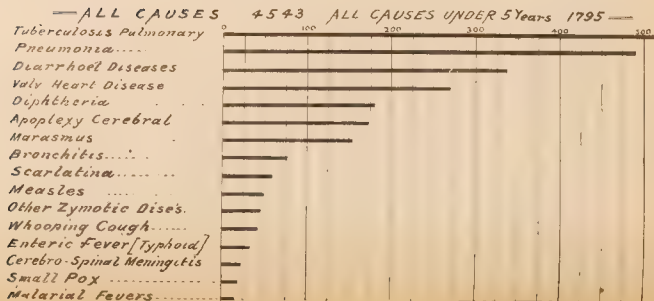
Six hundred and three deaths occurred in institutions. (See table III.)

The death rates for the various groups of ages per thousand of the population living at the same ages is as follows.

| Ages.       | Popu-<br>lation | Mor-<br>tality. | Rate per<br>thousand. |
|-------------|-----------------|-----------------|-----------------------|
| 0-1 year    | 5,490           | 1,164           | 212.02                |
| 0-5 years   | 26,247          | 1,795           | 68.39                 |
| 5-10 years  | 22,780          | 204             | 8.96                  |
| 10-20 years | 38,980          | 232             | 5.95                  |
| 20-30 years | 42,628          | 364             | 8.54                  |
| 30-40 years | 31,818          | 418             | 13.14                 |
| 40-50 years | 18,953          | 401             | 21.16                 |
| 50-60 years | 11,536          | 357             | 30.95                 |
| 60-70 years | 6,974           | 376             | 53.92                 |
| 70 and over | 3,997           | 396             | 99.07                 |
|             | 203,923         | 4,543           | 22.28                 |

*Some of the principal causes of death and those which are preventable are graphically shown in the following:*

# DEATHS FROM PRINCIPAL CAUSES DURING THE YEAR 1894 GRAPHICALLY SHOWN



## SOME OF THE CHIEF CAUSES.

**TUBERCULOSIS.**—This widespread disease is due to infection by a specific germ, and individuals of low vitality are more prone to it than those who are in robust health. The many dust-producing industries in Newark are a cause of a large number of pulmonary diseases; hence sanitation should be directed to secure the most healthful conditions of workshops. In tuberculosis much can be done by destroying the infectious material cast off. In June of this year the Board of Health adopted a resolution requesting physicians to report cases of tuberculosis, especially those occurring in lodging-houses and hotels. A circular on "*Tuberculosis, Its Communicability and Prevention*," has been ordered published. Since January 1, 1894, all houses in which deaths from tuberculosis occur are disinfected. Although the result of these measures will not be noticeable at once, it is nevertheless certain that a diminution in the number of individuals infected is sure to follow.

**PNEUMONIA.** The large number of cases of pneumonia, 488, is due mainly to climatic conditions. The sudden changes of humidity, temperature and pressure, to which the eastern sea coast cities are subjected, account largely for the prevalence of this disease. Another factor is the number of dust-producing industries in the city, and a third the dust arising from unpaved and uncleaned streets. Nothing renders the lungs more vulnerable than the inhalation of dust. Proper paving and keeping clean the streets of the city will tend to lessen the death rate from pulmonary diseases.

**DIARRHOEAL DISEASES.**—The number of deaths from

these diseases, 337, is small in comparison with other cities. Their number is largely dependent upon the milk and water supply. As the majority of those afflicted are infants and the cause of these diseases is usually some fermentative action, due to improper feeding, the careless preparation of the food, or to the use of improper feeding bottles, much good can be accomplished by the dissemination of facts relating to infant feeding and the preparation of infant food. A circular is now being prepared which clearly sets forth the proper methods to be pursued in infant feeding, and appended to it are notes on "*Nursery Hygiene*." It is intended to mail a copy of this circular to the address of each mother as soon as the birth of her child is recorded. In this way and with the aid of physicians and free clinics most will be reached. A decrease in the death rate from these diseases will follow.

**VALVULAR DISEASES OF THE HEART.** It has been authentically stated that heart diseases are increasing on the Atlantic sea coast. It is probable, as these diseases commonly have a rheumatic foundation, that the climatic conditions come largely into play and that the sudden temperature, humidity and pressure changes are in a large measure the cause; protection against these changes by proper clothing is necessary.

**ACUTE INFECTIOUS DISEASES.** These diseases are preventable and the deaths resulting therefrom are usually in direct proportion to the number of cases existing. Preventing the spread of these diseases will consequently lessen the number of deaths. More will be said of this in its proper place.

## COMPARATIVE STATISTICS.

It is irrational to compare the death rate of cities for the purpose of ascertaining the effects of recent sanitation unless the facts upon which the calculations are based, and the climatic and other conditions are alike. It would be *f. i.* absurd to compare the death rate of one city estimated on a population obtained by calculations based upon the United States Census, with the death rate of a city which estimates its population by multiplying the number of votes cast at an election by 5 or 7. In order that true comparisons be made, like must be compared with like.

At my request, Mr. F. W. Hoffman, statistician, has prepared a statement in which he estimates the population of Newark to be 203,923. He has also analyzed the mortality returns, and compared them with those of other cities. In doing this the main point that all comparisons be made on a like and equal basis has been adhered to. (Mr. Hoffman's statement is appended in full, because of its importance and value.)

On page 55 will be found comparative death rates for New York, Jersey City and Newark. It will be seen that the mean death rate for Newark and Jersey City, for the period from 1890 to 1894, is practically the same, the death rate of Newark for 1894 is somewhat lower than Jersey City, and is 1.47 per thousand of the population lower than that of New York. It will be noticed that in 1890 and in 1892 the death rate of Newark was excessively high, being 27.21 and 29.29 respectively. This was due to causes beyond sanitary control. During these years Grippe prevailed, and its ravages were naturally most marked, and it found a more fertile soil in that community in which, through occupation, a larger per-

centage of the inhabitants were rendered more susceptible to the disease than in those cities with which comparisons are made.

A reference to the United States Census of 1890 shows that there are employed in the three cities with which comparisons are made the following number of operatives, skilled and unskilled: New York, 227,342; Jersey City, 10,277; Newark, 30,000.

This represents per unit the following:

New York, 1 in 83 individuals; Jersey City, 1 in 17.8 individuals; Newark, 1 in 6.7 individuals.

It is self-evident that the proportionately larger number of individuals employed in manufacturing industries in Newark is the reason why the death rate will fluctuate at times above normal.

On page 56 will be found the population, mortality and death rate for various groups of ages per thousand living at the same age. A study of this table and the comparisons with other cities shows what proper sanitation is doing for Newark. In 1889 the total deaths under five years were 1,963, and in 1894 the total deaths under five years are 1,795, which is 168 less, notwithstanding the fact that the population since that time has increased over 20,000. *A useful test of the healthfulness of a locality, of its wealth and food supplies, and of its general sanitary condition, is the total death rate under five years.*

On page 51 the comparative mortality under five years for six leading cities will be found. It will be seen that Newark heads the list and that its child mortality is lower than that of cities having a larger population.

The comparative death rate of Newark for 1894 and a mean of four other cities, two of which are Western inland cities and two Atlantic sea coast cities, are found

on page 57. The rate for Newark is lower with two exceptions, namely for the period of five to twenty years and the period of forty to sixty years.

One of the reasons why the rate between five to twenty in Newark is higher is that the rate is considerably swelled by the number of deaths from the acute infectious diseases between the period of five to ten. The rate from ten to twenty is very little higher than the corresponding rate for the other four cities. The marked excess in the rates between the ages of forty to sixty should not be passed unnoticed. Between these ages the most frequent causes of death are (see table V).

|                                  |     |
|----------------------------------|-----|
| Apoplexy. . . . .                | 54  |
| Valvular Heart Disease . . . . . | 81  |
| Chronic Nephritis . . . . .      | 54  |
| Acute Pneumonia. . . . .         | 86  |
| Total . . . . .                  | 275 |

This number alone is excessive; however, it is noticeable that these causes are such which are mainly determined by mode of life, occupation and climatic changes. When we take this into consideration, together with the facts already stated, that Newark is a manufacturing city of many and varied industries, the reason why the rate between forty and sixty years is higher becomes apparent.

The comparative death rate from five specified causes between Newark and New York is found on page 59, and on the same page comparisons are made between New York, Jersey City and Newark relative to typhoid fever. The lower rates in favor of Newark cannot be construed as accidental.

Our unpaved and unsewered sections; the often filthy streets, which are not systematically cleaned, the con-



dition of a large portion of our meadow land, sewage-laden because of the defective condition of the wooden flume which carries the sewage from the pumping station to the Newark Bay, the miserable practice of a mixed collection of ashes and garbage and depositing them on the lowlands immediately adjacent to the built-up portions of the city—all these are factors which tend to make a city unhealthy and increase sickness and death.

The Board of Health has repeatedly called attention to these nuisances and recommended their abatement to those in authority. The ill effects which may accrue from the continued existence of these evils must be charged to them.

In concluding this brief statement of vital statistics I would call attention to tables IV and V; it is worthy of a close study, as it shows the actual mortality from some of the chief causes by districts representing the old wards. The approximate population for each ward is also given.

The fact that the Board of Health has access to the birth, marriage and death returns is owing to the courtesy of the City Clerk, the latter being the Registrar of Vital Statistics. This necessitates a double entry of all deaths, one in the office of the Board of Health for statistical purposes, the other in the books of the City Clerk as a matter of record. The vital statistics properly belong to Boards of Health, as the medical knowledge at command of Boards of Health is indispensable to the proper classification and recording of vital facts. Another and important reason is that it would bring the Board of Health in direct contact with and give it control over the undertakers in the city. This is of special importance in the disposition and burial of those dead from infectious diseases. I hope that these suggestions will be considered favorably by you and that steps be taken to secure the passage of a law which will make the Board of Health the *Registrar of Vital Facts*.

## INFECTIOUS DISEASES.

The following table shows the number of cases of diphtheria (including membranous croup), scarlatina, enteric fever and smallpox reported during the year by districts representing the old wards.

### INFECTIOUS DISEASES REPORTED

BY DISTRICTS REPRESENTING OLD WARDS

| WARDS.        | Estimated Population | Diphtheria, including member's croup. | Scarlatina. | Enteric Fever (typhoid). | Smallpox. |
|---------------|----------------------|---------------------------------------|-------------|--------------------------|-----------|
| First ..      | 8,565                | 7                                     | 48          | 3                        | 2         |
| Second ..     | 7,953                | 15                                    | 39          | 3                        | 2         |
| Third ..      | 7,137                | 7                                     | 21          | 1                        | 5         |
| Fourth ..     | 6,729                | 11                                    | 46          | 10                       | 34        |
| Fifth ..      | 6,118                | 21                                    | 19          | 2                        | 9         |
| Sixth. ..     | 28,957               | 83                                    | 211         | 12                       | 4         |
| Seventh ..    | 10,400               | 18                                    | 54          | 6                        | 4         |
| Eighth .      | 22,024               | 28                                    | 103         | 9                        | 2         |
| Ninth .       | 7,953                | 5                                     | 35          | 4                        | 7         |
| Tenth ..      | 15,498               | 23                                    | 81          | 5                        | 15        |
| Eleventh ..   | 13,255               | 24                                    | 108         | 9                        | 2         |
| Twelfth ..    | 22,024               | 19                                    | 100         | 8                        | 22        |
| Thirteenth .. | 30,996               | 189                                   | 190         | 12                       | 7         |
| Fourteenth .. | 6,322                | 8                                     | 49          | 5                        | 15        |
| Fifteenth ..  | 1,992                | 27                                    | 31          | 10                       | 1         |
| Total         | 1203,923             | 466                                   | 1,145       | 89                       | 131       |

**SMALLPOX.**

On the tenth of July, 1894, a case of smallpox was found in No 53 River street. The disease was well advanced, being in the tenth to twelfth day. The patient, an Italian child eight months old, was immediately removed to the Isolation Hospital, the tenement-house, occupied by about twenty-five people, was quarantined, thorough disinfection practiced and all exposed individuals were vaccinated. Infection in this case was traced to New York, a relative of the child having visited Newark during his convalescence from varioloid.

The quarantined house was located in a block of tenements inhabited mainly by Italians. It was evident that the number of persons who had been exposed to infection was large, because of the long time which elapsed before the child came under medical observation and the disease was recognized. General vaccination of all the residents of the section was resorted to and accomplished under some difficulty, owing to fear on part of the people. On the twenty-first of July six further cases had developed in No. 53, and on the following day cases were found in adjoining houses. These cases were, however, in their incipency and at once removed. Several other cases in the lower section of the city were also found and were traceable to River street. The continuance of the outbreak was due to concealed and unrecognized cases. There were brought to our attention during the outbreak at least four cases which were convalescent and which had been concealed through ignorance. To these cases a number of subsequent and scattered cases were traceable. Unrecognized cases were also responsible for a number of subsequent ones.

Vaccination often modifies the disease so that it is difficult to differentiate it from chicken pox and other eruptive skin diseases. Experience in smallpox goes to show that these mild unrecognized cases are more dangerous to the community than severe ones which are found in their incipency, and it is for this reason that when dealing with these mild cases, in which a positive diagnosis cannot be made, it is better to give the community the benefit of the doubt and treat the case as if it were one of true smallpox by proper isolation and disinfection.

The total number of cases to January 1st, was 131 and by months were as follows :

|                     |    |                    |    |
|---------------------|----|--------------------|----|
| July . . . . .      | 26 | October . . . . .  | 13 |
| August . . . . .    | 42 | November . . . . . | 9  |
| September . . . . . | 28 | December . . . . . | 13 |

The following table shows the number of those affected who were vaccinated and the result of the disease

|                                    |     | Result.  |       |
|------------------------------------|-----|----------|-------|
|                                    |     | Recovery | Death |
| Vaccinated once. . . . .           | 48  | 47       | 1     |
| Vaccinated twice. . . . .          | 1   | 1        |       |
| Vaccinated three times. . . . .    | 9   | 9        |       |
| Second attack of smallpox. . . . . | 1   | 1        |       |
| Unvaccinated. . . . .              | 72  | 55       | 17    |
| Total. . . . .                     | 131 | 113      | 18    |

In many of those who are recorded as unvaccinated an unsuccessful attempt had been made at different times during life, and most of them were vaccinated as soon as found.

From the beginning of the outbreak every case, as soon as diagnosed, was at once sent to the Isolation Hospital. Out of the 131 cases, only two exceptions had to be made, because removal would have endangered life.

Absolute quarantine was practiced during this out-

break; at its beginning there were at one time over 56 families quarantined, representing about 30 houses, which were guarded, and over 300 individuals. These had to be daily provided with food and inspected by physicians. Early in the outbreak it was found necessary to appoint two medical officers of quarantine, whose duty it was to visit daily all quarantined persons, attend to all outside vaccinations, and administer to the sick. Drs. Frank Connelly and E. E. Worl, who officiated in this capacity, deserve credit for the untiring zeal which they showed during these most trying times. Prior to the increase in the number of cases, and after their becoming less, this duty was performed by the District Physicians; they were always found ready and willing to comply with all orders that were issued, and invariably used tact and judgment in carrying them out.

The provisioning of this large number of quarantined persons was accomplished by establishing a commissary department in charge of two sanitary officers. A horse and wagon was provided, and all provisions were bought wholesale and delivered to the department store, which had been rented for that purpose; every morning rations for each family were prepared and distributed. This system worked admirably, all being promptly supplied with eatables, and what is remarkable none but a few trivial complaints were made.

In all about 200 families consisting of about 900 individuals were quarantined during the outbreak. These had all been exposed to the disease, and it was due to prompt removal of the patients, thorough disinfection and vaccination that the disease was brought under control.

**VACCINATION.** The school children, public and private, of the city are well vaccinated. Especially in the public

schools is vaccination strictly enforced, and no child is allowed to attend school unless it has been successfully vaccinated, or has had smallpox. A child in whom vaccination has been unsuccessful can attend school only on condition that at certain intervals revaccination is submitted to.

During the year 24,930 individuals were vaccinated by the Health Department in the Newark City Dispensary. This, together with the vaccinations made by District Physicians, will probably bring the total number of vaccinations to about 28,000.

The expenses of the outbreak will be found in the financial report, they are, however, incomplete, as all bills contracted for in 1894 have not yet been presented.

#### HOSPITAL ACCOMMODATIONS.

The building which is used to isolate smallpox patients will accommodate about 30, and was soon filled. Two hospital tents, one of which would hold about 25, and the other about 12 patients, were erected during August. The floors of these tents were raised platforms, and to a height of five feet wooden walls were constructed. The canvass was spanned over this structure, which afforded comfortable quarters.

The building referred to above has no modern conveniences, is not properly drained, was originally intended and built for a "pest house for paupers," is untenable and weatherworn, cannot be repaired, and hence a disgrace to the city of Newark, and a proof that progress in Newark is slow.

On two different occasions the Board of Health has successfully fought smallpox under trying and unfavorable circumstances. To accomplish this, cases had to

be isolated in the building above mentioned to the disgust of the Board of Health, its officers, and those whom the law compelled to go there.

*Where a community, through its Board of Health, resolves that patients suffering from smallpox shall be isolated in a hospital, then it becomes the duty of that community to procure hospital accommodations and comforts equal to those which the patient would have at home, and not a "Pest House" of the type of bygone centuries.*

The Board of Health has repeatedly requested the Common Council to provide funds for the erection of proper Hospitals for infectious diseases, and so long as the Common Council refuses to comply with the request of the Board in this respect, so long will any blame in the matter rest upon it, and not on the Board of Health.

A map showing the cases of smallpox topographically will be found appended to this report.

#### OTHER INFECTIOUS DISEASES.

**SCARLATINA AND DIPHTHERIA** These are preventable diseases, the infection taking place from person to person either by direct contact or indirectly through infected articles, such as clothing, bedding, etc., etc. It is improbable that their origin, as was formerly and is yet believed by many, is ever to be found in imperfect drainage, putrescent matter, etc. In this respect they differ from those diseases which may properly be called ground diseases. To the latter class belong typhoid fever and cholera. Here the infection can be carried from man to the soil or water and through these, others may in turn become infected.

In order to lessen the number of cases of scarlatina or diphtheria or any other infectious disease in a com-

munity two things are primarily essential, namely, isolation and disinfection.

First, *the isolation of the patient*, i. e., placing the patient in surroundings which will make it impossible for him to infect others. If this cannot be done at home it becomes the duty of the community to provide suitable accommodations in the form of an *Infectious Disease Hospital*. Failure to provide such accommodations means the infection of many others, for isolation at home can rarely be accomplished and the deaths which result from these cases are the result of what, from an advanced view, must be looked upon as criminal negligence on the part of the community. Two hundred and forty-nine children died of diphtheria and scarlet fever last year. If the same number were killed through agencies coming under the police control of a city the community would be up in arms and thousands of dollars would be willingly and justly appropriated to abate the cause. Why not the same public spirit in relation to infectious diseases?

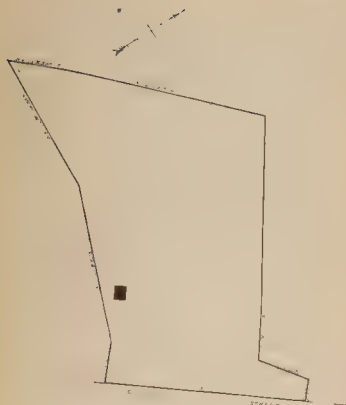
Second, *the disinfection*. The patient having been isolated it becomes necessary to render harmless all infectious material coming from him. Thorough disinfection is as necessary as isolation.

In June the board, upon recommendation, authorized the Medical Officer of Health to organize a Disinfecting Corps; four men from the Sanitary Police Force were detailed to this work; they attend to all matters relating to infectious diseases and this work is more effectively performed than ever before. When the Disinfecting Station is completed nothing will remain to be done to secure prompt and effective disinfection in every case brought to notice. During 1894 this corps disinfected the following number of houses :



|   |       |
|---|-------|
| Houses in which deaths from tuberculosis had occurred . | 515   |
| Houses in which scarlatina had occurred . . . . .       | 1,145 |
| Houses in which smallpox had occurred . . . . .         | 131   |
| Houses in which diphtheria had occurred . . . . .       | 466   |
| Total number of houses disinfected . . . . .            | 2,257 |

In a general way it may be said that while the facilities for the eradication of infectious diseases have been the same during the year just passed as heretofore, still several important steps were taken which will soon give the Board a model Disinfecting Station, and it is hoped that proper hospital facilities will speedily follow. Twenty four and a quarter acres of good land were purchased by the city for infectious disease purposes. The price paid was \$15,000. Upon this site the Disinfecting Station will be erected and it is proposed to add hospital buildings for scarlatina, diphtheria, smallpox and other infectious diseases which may need hospital care. The land is located on Grove street, Clinton Township, and is about 1,000 feet from the city line, besides being in the territorial centre of future Newark.



CITY OF NEWARK  
 SITUATED IN  
 CLINTON TOWNSHIP  
 N. J.

Scale 400 ft. to one inch

*The Disinfecting Station*, for which contracts have been awarded, was designed by Mr. Franklin Phillips and Mr. Edward Dunn, of this city, and the writer. The building containing the plant is 58 by 46 feet. There is no communication between the receiving-room for *infected* goods

and the discharging-room for *disinfected* goods, excepting through the sterilizer and the bathroom and dressing-rooms for the men handling the infected articles. On the infected side is to be a crematory designed for the incineration of worthless infected articles or to be used in case of epidemic. All floors are to be of chert stone and walls of hard plaster coated with waterproof porcelain paint. The sterilizer to be first used is an oblong steam jacketed retort 4 by 4 feet wide and eight feet long. It is so arranged that alternating currents of hot air and steam can be introduced, the latter under any desired pressure. Condensation in the sterilizer will be impossible and all disinfected articles will come out of the sterilizer perfectly dry. The plant is of sufficient capacity to supply the necessary steam, etc., for two additional sterilizers 6 by 6 feet wide and twelve feet long.

When, after a case of infectious disease, the premises are ready for disinfection, the method pursued will be the following:—

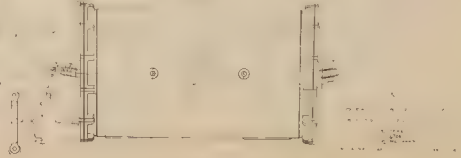
A wagon used for infected goods only will be sent to the premises. All infected articles, which cannot be rendered sterile by disinfecting solutions, will be put into large canvass sacks and taken to the station. (Such articles are mattresses, pillows, carpets, blankets, hangings, clothes, &c., &c.) It is estimated that articles can be taken from any point in the city to the station, there disinfected, and returned to the premises within six hours. While the articles are being disinfected at the station, a corps of men will wash or spray all surfaces in the infected apartments with disinfecting solutions. There are many other details of the disinfection of walls, &c., which cannot be given here, but the salient points in this method over the old fumigating system are that: -

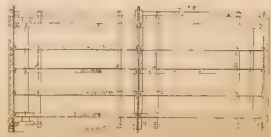
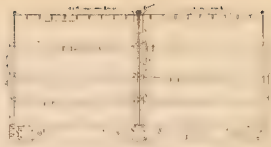
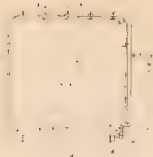
*That the disinfection is the rough, and that it will take only one half the time which it takes to fumigate with sulphur. The latter method is of doubtful efficacy, and impracticable on account of the irritating fumes created and the time required.*

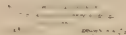


Fig. 1

1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 11. 12. 13. 14. 15. 16. 17. 18. 19. 20. 21. 22. 23. 24. 25. 26. 27. 28. 29. 30. 31. 32. 33. 34. 35. 36. 37. 38. 39. 40. 41. 42. 43. 44. 45. 46. 47. 48. 49. 50. 51. 52. 53. 54. 55. 56. 57. 58. 59. 60. 61. 62. 63. 64. 65. 66. 67. 68. 69. 70. 71. 72. 73. 74. 75. 76. 77. 78. 79. 80. 81. 82. 83. 84. 85. 86. 87. 88. 89. 90. 91. 92. 93. 94. 95. 96. 97. 98. 99. 100.









[illegible]

The following is a description of the sterilizers by Mr. Franklin Phillips, Civil Engineer, who designed them.

"The apparatus consists of a steam jacketed sterilizing retort, provided with swinging doors at each end. A steam boiler to generate the necessary supply of steam, a fan blowing apparatus which forces fresh air over hot pipes, and a steam engine to drive the blowing apparatus, together with the necessary steam and air conveying pipes, are the essential features of the apparatus.

When infected goods are brought into the station they are placed on a metal car of light frame work, supported on portable tracks shown on drawing. The car is rolled into the sterilizer, the door is closed and tightly bolted, both valves connecting the interior of the sterilizer and the atmosphere are tightly closed, steam at a boiler pressure of 20 to 30 pounds is admitted to the interior; and after being subjected to a temperature due to this pressure for from ten to thirty minutes, the waste steam is blown off and the large valves opened to the atmosphere. The blowing apparatus is started, and heated air is then blown through the sterilizing chamber. After the materials have been thoroughly dried the door at the opposite end of the sterilizer is opened into a room free from infection of any kind.

To charge the apparatus again, it is necessary to return the car to the sterilizer, closing and securing the door behind it. The operation is then repeated."

A table is given of temperatures ranging from atmosphere to 40 pounds per square inch.

| Total<br>pressure<br>per sq. in.<br>above zero.<br>Pounds, | Temperature<br>in<br>Fahrenheit<br>degrees. |                          | Total<br>pressure<br>per sq. in.<br>above zero.<br>Pounds | Temperature<br>in<br>Fahrenheit<br>degrees. |
|--|---|--------------------------|---|---|
| 1  | 102.0                                       |                          | 28  | 246.4                                       |
| 2  | 126.3                                       |                          | 29  | 248.4                                       |
| 3  | 141.6                                       |                          | 30  | 250.4                                       |
| 4  | 153.1                                       |                          | 31  | 252.2                                       |
| 5  | 162.3                                       |                          | 32  | 254.1                                       |
| 6  | 170.2                                       |                          | 33  | 255.9                                       |
| 7  | 176.9                                       |                          | 34  | 257.6                                       |
| 8  | 182.9                                       |                          | 35  | 259.3                                       |
| 9  | 188.3                                       |                          | 36  | 260.9                                       |
| 10   | 193.3                                       |                          | 37  | 262.6                                       |
| 11   | 197.8                                       |                          | 38  | 264.2                                       |
| 12   | 202.0                                       |                          | 39  | 265.8                                       |
| 13   | 205.9                                       |                          | 40  | 267.3                                       |
| 14   | 209.6                                       |                          | 41  | 268.7                                       |
| 14.7   | 212.0                                       | ., atmospheric pressure. | 42  | 270.2                                       |
| 15   | 213.1                                       |                          | 43  | 271.6                                       |
| 16   | 216.3                                       |                          | 44  | 273.0                                       |
| 17   | 219.6                                       |                          | 45  | 274.4                                       |
| 18   | 222.4                                       |                          | 46  | 275.8                                       |
| 19   | 225.3                                       |                          | 47  | 277.1                                       |
| 20   | 228.0                                       |                          | 48  | 278.4                                       |
| 21   | 230.6                                       |                          | 49  | 279.7                                       |
| 22   | 233.1                                       |                          | 50  | 281.0                                       |
| 23   | 235.5                                       |                          | 51  | 282.3                                       |
| 24   | 237.8                                       |                          | 52  | 283.5                                       |
| 25   | 240.1                                       |                          | 53  | 284.7                                       |
| 26   | 242.3                                       |                          | 54  | 285.9                                       |
| 27   | 244.4                                       |                          | 55  | 287.1                                       |

#### BACTERIOLOGICAL LABORATORY.

In diphtheria scientific research has shown that many of the cases of membranous inflammation of the throat and larynx are not cases of true diphtheria. These cases of pseudo diphtheria have a low mortality, while in true diphtheria the death rate is high; both are, however,



MAP  
OF  
THE CITY OF  
**NEWARK**  
STATE OF  
**NEW JERSEY**

Scarlet Fever

Scale of 10 miles (approximate) from 25 to 100 miles





exceedingly infectious and isolation and disinfection should be practiced in one as well as in the other.

It is often impossible to differentiate clinically between true and false diphtheria. Recent advances in the treatment of diphtheria make an early diagnosis of the disease imperative. This can be done only by bacteriological examination. In my monthly report to the Board for November, 1894, and on several previous occasions, the establishment of a bacteriological laboratory is recommended. The equipping of such a laboratory is not very expensive, a competent bacterologist will have to be placed in charge. In the light of modern sanitation a bacteriological department is a necessary and indispensable adjunct to a properly equipped Board of Health. It is not alone in diphtheria that bacteriological examinations are of value, but also for diagnosis in suspected cases of tuberculosis, typhoid fever and cholera. In the detection of infectious diseases in animals, often the culture tube and microscope alone will reveal the truth. Of equal importance is the bacteriological examination of water and food. Newark should be one of the first communities to establish such a laboratory, and keep abreast with the advancements made in the field of preventive medicine.

#### **WHOOPIING COUGH, MEASLES AND CHICKEN POX.**

These three diseases are not reportable in this city. The first two are often fatal. The deaths from measles during 1894 were 49 in number, and from whooping cough 44 died. While it would not be expected that the Board of Health take the same stringent measures in these diseases as in diphtheria, scarlatina and smallpox, nevertheless if, by ordinance, physicians were compelled

to report them, the notification to the schools of the existence of these cases and ordinary isolation and disinfection would probably greatly diminish their numbers.

Chicken pox is rarely fatal, but it should be included with the others in the reportable list, because of the difficulty which often arises to differentiate between it and modified smallpox. Doubtful cases would in this way be brought to the attention of the Board, and grave errors perhaps be avoided.

#### NOTIFICATION OF INFECTIOUS DISEASES.

Every day a list of all the houses from which cases have been reported is sent to the Board of Education, and it in turn notifies each Principal of the cases in his district. Every second day a list of all the cases reported is sent to every private school in the city, and on Saturday morning a weekly list is forwarded to the superintendents of all Sunday Schools and other places where children congregate, many of the large stores employing girls and young men are also notified. When it is found that an infectious disease exists in the house of a scholar, or an employé, farther attendance from school or work is prohibited until all danger of carrying the infection has passed.

#### TYPHOID FEVER.

The introduction of our new water supply and the closing of wells has caused a marked diminution in this disease. In many of the cases that occurred, the infection was traceable to out of town sources. If all the wells in the City of Newark were closed, this disease could only occur by being introduced from without, and would have very little chance of spreading.



## MAPS.

Appended to this report are maps, showing the distribution of cases of scarlatina for 1894, the cases of diphtheria and smallpox for 1894, and also the cases of typhoid fever. In the typhoid fever map the *black dots* represent all cases reported for the period from January 1st, 1891, to December 31st, 1893, and the *red dots* represent the cases reported during the year 1894. The *green crosses* on this map show the wells which have been found in the city to date. The latter map, especially, is worthy of careful study.

## WATER SUPPLY.

The City of Newark draws its supply of water from the Pequannock Water Shed, where two large storage reservoirs impound a supply which, it is calculated, will last three months, at the rate of 50,000,000 gallons a day.

In conjunction with Dr. A. C. Hunt, Medical Inspector of the State Board of Health, the writer made a thorough inspection of the water shed in May, 1893. The territory was found comparatively free from sources which might contaminate the water.

The following is a summary of the sources of contamination :—

## FIRST --PRIVIES.

|  |   |
|--|---|
| Privies found built over stream . . . . .  | 3 |
| Sewer drains connected with water-closets, and emptying directly into water. . . . . | 2 |
| Privies, 15 feet or less from stream . . . . .                                       | 7 |
| "    about 30 feet from stream . . . . .   | 6 |
| "    about 50 feet from stream . . . . .   | 2 |
| "    about 75 feet from stream . . . . .   | 1 |
| "    about 100 feet from stream. . . . .   | 5 |
| "    (open surface), 150 feet from stream . . . . .                                  | 6 |

|  |    |
|--|----|
| Privies, (open surface), 200 feet from stream. | 7  |
| " (open surface), 250 feet from stream         | 3  |
| Total  | 42 |

**PRIVY VAULTS FOUND:** These mainly very shallow and not water tight may at any time become sources of direct contamination:—

|   |    |
|---|----|
| About 50 feet from stream   | 1  |
| About 75 feet from stream.  | 3  |
| About 100 feet from stream  | 2  |
| About 200 feet from stream  | 3  |
| About 250 feet from stream  | 2  |
| Total   | 13 |
| Number of vaults found within 150 feet, but exact distance not determined | 10 |
| Cesspool, with water closet connections, 150 feet from stream.            | 1  |

The above gives a total of 66 direct and indirect sources of contamination. Of these, those 100 feet or less from the border of the stream are deemed as directly contaminating. They number 26 (including those built over stream and those draining into water by means of sewer—five in all).

#### SECOND—BARNs.

|                          |    |
|--------------------------|----|
| Within 5 feet.           | 1  |
| Within 15 feet.          | 2  |
| Within 25 feet.          | 2  |
| Between 25 and 50 feet   | 2  |
| Between 50 and 100 feet. | 2  |
| Over 100 feet            | 6  |
| Total.                   | 16 |

Those given are such from which contamination takes place.

#### THIRD—PIG STYES.

|                          |    |
|--------------------------|----|
| Within 10 feet.          | 4  |
| Within 25 feet.          | 6  |
| About 50 feet.           | 1  |
| About 100 feet and over. | 4  |
| Total                    | 15 |

From the above it will be seen that in all were found about 97 actual and possible sources of animal contamination.

Among the barns found there were a few in very close proximity to the water edge and the drainage from these was directly into the stream.

From the foregoing it will be seen that the main reason why animal contamination is slight is because habitation in the area drained by the Pequannock River and its tributaries is so very small. In fact there is perhaps no other region in New Jersey covering the same number of inhabitable square miles in which so few people live. But the majority drain directly or indirectly into streams from which Newark draws its water supply.

It is self-evident that, although the existing contamination is very small, measures should at once be adopted which will insure absolute purity of the water and exclude any possibility of infection from epidemic diseases. Under the present conditions should typhoid fever or cholera occur in the Pequannock region the germs of these diseases might readily find their way into the water and would in consequence prove a source of great danger to this community. Of as great importance as is the removal of existing nuisances is the prevention of those which may occur hereafter. This region is open to increased settlement, and hand in hand with it will come increased pollution unless steps are taken to prevent it.

Already Cedar Pond, which is one of the sources from which Clinton reservoir draws its water, has been bought by a Passaic Company. They own about 2,500 acres and intend to establish summer residences there. This may happen in other sections of the drainage area f. i. Hanks Pond and Echo Lake or around the reservoirs

Personally the writer believes that the only way in which a water supply of the size of the one on which Newark depends can be kept permanently free from pollution is by either the State or the municipality owning sufficient land adjacent to the reservoirs and all the streams and tributaries to insure forever non-contamination. In other words, to exclude habitation. Sanitary regulations may answer for a time in thinly populated sections, but as human habitation increases these are no longer sufficient, for with increased population comes increased filth and the latter must reach at some time in any given section what may be called a point of saturation, and when that point is reached the surplus will find its way by natural means into the general drainage system of that section. Watersheds should be free from human habitation and its accompanying filth, and in order to accomplish this, State or municipal ownership of watersheds is essential.

Until such steps are taken what can be done to abate existing nuisances and prevent the establishing of new ones? The answer is as follows. The enforcement of the present laws, especially the law of 1893, Chapter 157, which makes it a misdemeanor to contaminate in any manner the water of any creek, stream, etc., used for drinking purposes. It may be added that it is clearly the duty of the Board of Street and Water Commissioners to take active steps by prosecuting those who are at present allowing filth of any kind directly or indirectly to find its way into the streams or their tributaries in the Pequannock watershed.

It should be mandatory that no privies or manure pits be maintained within a distance of at least 200 feet of freshet truck and these should be constructed absolutely

water tight and in such a way that the contents can be easily removed and disinfected. Cesspools should be built at least the same distance from the water, and in no case should water closet connection be allowed with them. The use of the earth closet system should be allowed, providing the disposition of the contents is satisfactory to some competent authority.

At several points in the watershed the main pipe of the Standard Oil Company was found exposed and unprotected. It was found crossing the Echo Lake brook, about 300 feet from Clinton reservoir, and several large rocks were resting upon it. So far as can be ascertained no large leaks have occurred in the last few years, but should the pipe break at this point, or at several others noticed, the escaping oil would find its way directly into the water, and if in sufficient quantity would render it unpotable for a time. Where the pipe is found unprotected near streams the Standard Oil Company should be compelled to take all possible precautions to prevent leaks from occurring. All rocks resting on the pipe or in danger of falling upon it should be removed and iron guards should be built around the pipe for protection. Frequent inspections of the line should be made.

#### WELLS.

A systematic examination of well water was commenced in June, 1892. A diagram of the premises and surroundings was made in each case, showing the location of the well and the number of contaminating sources within a given radius—see table VI. Up to January 1, 1895, 462 wells had been recorded and the result of the analyses is graphically shown in the following, representing 425 wells analyzed:

---

*Contaminated, 57  $\frac{17}{100}$  per cent.*

---

*Suspicious, 27  $\frac{30}{100}$  per cent.*

---

*Passable, 15  $\frac{5}{100}$  per cent.*

---

A glance will convince the most skeptical that the "pure and sparkling" well water is usually poor and polluted. It was found that in 63 instances typhoid fever had occurred on the premises on which wells were found. The wells that were found contaminated were ordered closed by the Board of Health, and in all cases where the city's water supply was available this was done. Where the people, however, were dependent upon well water, there being no water main in the street, they were advised to boil the water before using it. In most cases mains were promptly laid by the Water Department where chemical analysis showed the wells unfit for domestic use.

In the appendix will be found two tables, one showing alphabetically every well which has been recorded, together with such facts as were deemed essential to a proper understanding of its surroundings. The other table is that of the chemist, and gives the analysis of each well. The "sample number" is the same in each, and will afford an opportunity for comparison.

*The work which has been done in this line has now reached a point where we can safely say that the wells of our city are contaminated to such an extent that their continuance is a standing menace to the public health. With one of the best water supplies in the world, and a Water Department which can and is willing to extend the mains to any necessary point, it seems almost criminal to allow the existence of surface wells.*

*It is recommended to your Board that an ordinance be passed prohibiting the further maintenance or construction of*

*surface or dug wells in the City of Newark And, further, that no driven or bored wells be constructed or maintained without permission of the Board of Health, and then only where the water is intended for manufacturing purposes.*

#### CHEMICAL ANALYSES, MILK AND FOOD INSPECTION.

The Department has had the valuable assistance of a regularly appointed chemist under a fixed salary. The report of the chemist will be found on page 65, and is very instructive. Besides the many water analyses, milk and food analyses have also been made. The city water has been analyzed at regular intervals.

**MILK.**—Upon this important article of food depends the health of the infant population of the city. The Board has one Milk Inspector, who examines the milk on wagons and in stores with a lactometer. This test is unsatisfactory because it shows only whether the milk has been watered or not; it does not determine its quality.

The work performed by the Milk Inspector was as follows:

|   |       |
|---|-------|
| Number of wagons halted.....                            | 1,462 |
| “ cans of milk inspected.....                           | 2,703 |
| “ lactometer tests.....                                 | 1,240 |
| <hr/>   |       |
| Number stores visited.....                              | 1,609 |
| “ cans milk inspected.....                              | 1,630 |
| “ lactometer tests.....                                 | 1,170 |
| Samples found suspicious and delivered to the chemist.. | 24    |

It does not seem that the small number of suspicious samples found warrants the continuance of the present system. We should strive to obtain our milk from cows which are properly housed and fed and which are free from any suspicion of disease. To this end I would

recommend that all dealers in milk, resident or non-resident, be licensed by the Board. The license could properly be fixed at \$2.00 and the Board should reserve the right to revoke the same. This would give the Board absolute control of dairies located out of town, and when it is known that unsanitary conditions are maintained in any particular dairy the sale of milk from that dairy could be prohibited by revoking the dealer's license.

As to local inspection, I would suggest that instead of one Milk Inspector the whole Sanitary Police Force be at such times as may be thought proper detailed to take as many samples as possible and deliver them sealed to the chemist. This would probably result in an examination of double the quantity of milk now examined and would have the advantage of having all the samples tested by the chemist, who is a competent person to do so.

*Food Analyses* have not been systematically pursued, as the chemist's time was mainly devoted to water analysis. The latter being practically finished, it is intended to commence a systematic investigation of foods and perhaps drugs during the ensuing year.

#### COW STABLES.

A thorough inspection of the cow stables in the city has been made and unsanitary conditions corrected as far as possible. The stables referred to are those where milk is produced for sale.

Table VIII, in the appendix, contains the list and the result of the inspections.

It will be observed that the questions asked are such as will give the reader a mental picture of the condition of the stable.

While the general condition is fair, yet it is hardly to



be presumed that cows which are kept in close quarters and do not have good pasturage and room for exercise will give wholesome milk. While no complaints are made against these stables, many of them are nevertheless a nuisance. I would recommend that some steps be taken to bring about the gradual abolition of cow stables in Newark. This can probably be best done by passing an ordinance fixing certain limits where stables can be maintained—similar to the fire limits for frame dwellings—and prescribing the distance which a cow stable should be from surrounding dwelling-houses, and further, not allowing the maintenance of a stable unless there is sufficient room adjacent thereto for pasturage and exercise.

*Three hundred and eighty animal permits* (cows, goats and swine) were issued during the year and the number of animals licensed through these was 1,304.

## PLUMBING DEPARTMENT.

---

This department is now perfected, and the work done by the two inspectors is very creditable. A uniform system of filing plans has been adopted, and the index by streets and the filing system are so arranged that in future years the plumbing plans of any house, together with the specifications, can be found at once, no matter when the plan was filed. These plans will be of considerable value in years from now, as they show the location of all pipes and fixtures.

The following is a summary of the work done in the Plumbing Department during the year —

|  |       |
|--|-------|
| Permits issued to construct plumbing systems | 955   |
| Number of plans and specifications filed     | 1 031 |
| Plans rejected, . . . . .                    | 44    |
| Water tests, number of. . . . .              | 1,238 |
| Number of peppermint tests                   | 172   |
| " plumbing inspections                       | 1 587 |
| " final plumbing inspections.                | 1 046 |
| " permits for McClellan vents                | 379   |
| " special plumbing inspections.              | 203   |
| " violations, notices issued . . . . .       | 19    |
| " schools, private and public, inspected     | 71    |

## MEAT AND LIVE STOCK DEPARTMENT.

This department is in charge of two inspectors, one a veterinarian, who looks after the slaughter-houses and wholesale meat depots, and the other an experienced butcher who visits all the public and private meat and vegetable markets. Good work has been done by them. This department costs a little over \$2,000 yearly. I believe that by licensing all the butchers, wholesalers and retailers and the slaughter-houses, this department could be made self-sustaining and recommend that this be done. The following is a summary of the inspections in this department and the condemnations during the year.

### SLAUGHTER-HOUSE INSPECTION.

|                                       |        |
|---------------------------------------|--------|
| Number of cattle inspected            | 11,709 |
| " calves inspected . . . . .          | 14,793 |
| " sheep and lambs inspected . . . . . | 16,058 |
| " swine inspected . . . . .           | 4,030  |

### CONDEMNED.

|   |    |
|---|----|
| Number of cattle . . . . .                  | 25 |
| " calves . . . . .                          | 47 |
| " horses (on account of Glanders) . . . . . | 8  |
| " mules " " " . . . . .                     | 1  |

## INSPECTION OF BUTCHER SHOPS AND CONDEMNATIONS.

|                                  |         |
|----------------------------------|---------|
| Number visited.....              | 11,570  |
| " carcasses beef inspected . . . | 33,645  |
| " lambs and sheep inspected      | 108,075 |
| " calves inspected . . .         | 28,760  |
| " swine inspected                | 12,850  |

## CONDEMNED

|   |       |
|---|-------|
| Bob veal, carcasses . . .   | 44    |
| " " panels . . .  | 283   |
| " " quarters . . .  | 52    |
| Beef, loin . . .  | 4     |
| " panels . . .  | 1,390 |
| Lamb, carcasses . . .   | 25    |
| Chicken, pounds.....  | 667   |
| Fish, pounds.....   | 870   |
| Mutton, carcasses.....  | 1     |
| Beef, quarters. . .   | 5     |
| Pork, pounds.....   | 36    |
| Corned beef, pounds.....  | 200   |
| Turkey, pounds.....   | 758   |
| Capon, pounds... ..   | 140   |
| Geese, pounds.....  | 136   |
| Smoked Hams . . .   | 52    |
| Ducks, pounds . . .   | 70    |
| Veal, pounds . . .  | 270   |
| " quarters . . .  | 2     |
| Mutton, pounds . . .  | 39    |
| Calves . . .  | 29    |
| Two boxes of chickens, 1½ barrels of peas, 1 barrel of veal, 1 barrel of chickens, ½ barrel of turkeys, 1½ barrels of ducks, 4 crates eggs, 1 wagon load vegetables, 1 wagon load fruit, 1 barrel of geese. |       |

## SANITARY INSPECTIONS.

In this department, under the supervision of Superintendent David D. Chandler, the following work was accomplished during the year :—

|                                      |       |
|--------------------------------------|-------|
| Number of citizens' complaints . . . | 1,710 |
| " " " " verified.....                | 1,298 |
| " " " " no cause found.....          | 412   |

|  |        |
|--|--------|
| Number of written notices served           | 3 892  |
| “ nuisances abated . .                     | 3 022  |
| “ cases of defective drainage abated       | 1 282  |
| “ original inspections                     | 11,235 |
| “ verbal notices given                     | 1,188  |
| “ abatements nuisances                     | 1,072  |
| “ abatements, defective drainage           | 161    |
| “ hours spent in court by inspectors       | 133    |
| “ permits issued for cleaning Privy Vaults | 1 295  |
| “ permits issued “ “ Cess Pools            | 125    |
| “ sewer drains inspected . . .             | 893    |

The strict enforcement of the ordinances of the Board has done much to improve the sanitary condition of the city. Hundreds have been compelled to abandon cess-pools and sewer connect their premises. The plumbing in dwellings has been carefully looked after, and changes ordered when found defective; much filling in of sunken and marsh lands was accomplished. Lodging houses have been frequently inspected, and a complete census taken, and unsanitary conditions rectified. Citizens' complaints have been promptly and impartially investigated.

A word should be said relative to the cleanliness of streets and sidewalks and to the manner in which citizens set out garbage for collection by the scavenger. In this respect Newark is far behind other cities, because the Board of Health and other city departments have not had that cooperation of the Police Department which they should have. There are cities where the individual police officer is made responsible for the sanitary condition of his beat—only, however, as far as sidewalks and streets are concerned. The vigorous enforcement of such a policy here would soon give us a clean city. Broken and overflowing garbage receptacles, gutters filled with rubbish and paper, making unsightly our principal thoroughfares—all these would soon disappear. Those who

are not acquainted with Newark's sanitary condition are apt to judge it by the condition of its streets and highways, that their impression is a poor one naturally follows.

## THE NEWARK CITY DISPENSARY AND THE OUTDOOR POOR DEPARTMENT.

This department is under control of the Board of Health, and is maintained out of its appropriation. The total cost of maintaining it was for 1894 \$8,922.53, a detailed statement of the expenses will be found in the financial report for the year. This large amount of money comes out of the Board's general appropriation, and in calculating the expenses of the Board for sanitary purposes should not be included.

### SUMMARY OF REPORT OF CITY APOTHECARY.

|  |        |
|--|--------|
| Number of new cases treated at City Dispensary. .... | 5,345  |
| “ vaccinations. ....                                 | 24,930 |
| “ prescriptions by clinic. ....                      | 23,136 |

### Number of prescriptions prescribed by District Physicians :—

|                        |       |
|------------------------|-------|
| First district. ....   | 843   |
| Second district. ....  | 895   |
| Third district. ....   | 1,710 |
| Fourth district. ....  | 1,113 |
| Fifth district. ....   | 1,277 |
| Sixth district. ....   | 826   |
| Seventh district. .... | 652   |
| Eighth district. ....  | 873   |
| Ninth district. ....   | 703   |
| Tenth district. ....   | 808   |

---

9,700

Total number of prescriptions. .... 32,836

## SUMMARY OF SERVICES RENDERED BY THE DISTRICT PHYSICIANS.

|                       | Cases.       | Visits.      | Sent to<br>Hosp. | Deaths.    |
|-----------------------|--------------|--------------|------------------|------------|
| First district. ....  | 346          | 616          | 15               | 19         |
| Second district. ...  | 836          | 1,258        | 67               | 36         |
| Third district. ....  | 526          | 1,266        | 46               | 17         |
| Fourth district. .... | 427          | 618          | 52               | 8          |
| Fifth district. ....  | 699          | 1,885        | 42               | 16         |
| Sixth district. . . . | 581          | 1,315        | 25               | 19         |
| Seventh district. . . | 361          | 665          | 21               | 11         |
| Eighth district. .... | 571          | 902          | 43               | 13         |
| Ninth district. ....  | 402          | 599          | 19               | 13         |
| Tenth district. . . . | 543          | 1,012        | 27               | 14         |
|                       | <u>5,292</u> | <u>9,636</u> | <u>357</u>       | <u>166</u> |

The total amount spent for drugs was \$2,397.27, making the average cost of each prescription seven and three-tenths cents.

A detailed financial statement of the money expended by the Board of Health for the year ending December, 1894, is appended.

The meteorological reports of Professor George C. Sonn are given in detail in table IX., together with a summary for the year.

In conclusion, I desire to thank the Board of Health and its members individually for the confidence which they have reposed in me, and beg leave, also, to express my thanks to all the officers of the executive department of this Board for the cheerfulness and alacrity with which they have performed their arduous and often not very pleasant duties.

CHARLES LEHLBACH,  
*Medical Officer of Health.*

## MORTALITY STATISTICS.

---

Analysis by F. L. Hoffman.

---

*Dr. Charles Lebbach, Medical Officer of Health, Newark,  
N. J.*

MY DEAR SIR:—In your favor of recent date you ask me to make a brief analysis of the Newark mortality returns for the year 1894, and at the same time give my opinion in regard to the probable population and consequent death rate of the city for 1894.

A brief discussion is difficult, since so many points need a lengthy explanation to enable those not familiar with statistical method and statistical fallacies to properly judge of the value of the conclusions arrived at.

The question of population alone is deserving of a detailed discussion to set at rest the many erroneous views that so generally prevail, even among the otherwise well informed, in regard to the method by which a fairly accurate estimate of the population for intercensal years can be arrived at. The only scientific and fairly reliable method is that known as the Registrar-General's, on the principle of the geometrical increase of the population of communities of normal growth. This method is in use in all the foremost statistical offices of the world and is in this country employed by the Massachusetts State Board of Health, Dr. Billings, expert special agent of the census, etc. I am fully aware that there are many who will not accept the census of

1890 as accurate and trustworthy, but after a careful analysis of the elements of the population of fifteen leading cities I feel entirely safe in asserting that the Eleventh census is as trustworthy as any of the ten that have preceded the same. To adopt an arbitrary method for this purpose is simply making matters worse and to calculate the population on the basis of assessed polls, the number of houses build, the number of votes cast in the last election or the number of names in the city directory is nothing but the merest guess work.

In accordance with the geometrical method the following estimates of the population of Newark, Jersey City and New York City have been calculated, and if the corresponding death rates are not as favorable as they would be if a higher estimate of the population of the city were accepted as a basis, it is always better in this matter to understate than to overstate the death rate of a city. To over-estimate a death rate on a fictitious population is nothing less than an attempt to delude citizens into a sense of security in regard to their health and well being and in consequence an inducement to relax in vigilance over matters which are the most important elements of the welfare of a city.

The four tables which follow show the population, mortality and death rates of Newark, Jersey City and New York for the period 1890-1894, as well as the mean death rate for the five-year period :—



# POPULATION, MORTALITY AND DEATH RATE FOR NEWARK, JERSEY CITY AND NEW YORK, 1890-1894.

## NEWARK, N. J.

|         | Popula-<br>tion. | Mor-<br>tality.* | Rate per<br>1,000. |
|---------|------------------|------------------|--------------------|
| 1890    | 181,830          | 4,948            | 27.21              |
| 1891    | 187,118          | 4,420            | 23.62              |
| 1892    | 192,560          | 5,641            | 29.29              |
| 1893    | 198,160          | 4,900            | 24.73              |
| 1894    | 203,923          | 4,760            | 23.34              |
| 1890-94 |                  |                  | 25.60              |

\*For fiscal year ending June 30.

## JERSEY CITY, N. J.

|         | Popula-<br>tion. | Mor-<br>tality.* | Rate per<br>1,000. |
|---------|------------------|------------------|--------------------|
| 1890    | 163,129          | 4,258            | 26.10              |
| 1891    | 168,102          | 4,386            | 26.09              |
| 1892    | 173,226          | 4,633            | 26.75              |
| 1893    | 178,506          | 4,541            | 25.44              |
| 1894    | 183,947          | 4,320            | 23.48              |
| 1890-94 |                  |                  | 25.54              |

\*Fiscal year ending June 30.

## NEW YORK CITY, N. Y.

|         | Popula-<br>tion. | Mor-<br>tality. | Rate per<br>1,000. |
|---------|------------------|-----------------|--------------------|
| 1890    | 1,515,301        | 40,103          | 26.47              |
| 1891    | 1,550,255        | 43,659          | 28.17              |
| 1892    | 1,585,925        | 44,329          | 27.95              |
| 1893    | 1,622,508        | 44,486          | 27.42              |
| 1894    | 1,659,937        | 41,175          | 24.81              |
| 1890-94 |                  |                 | 26.94              |

## COMPARATIVE DEATH RATES, 1890-94.

|         | Newark. | Jersey City. | New York. |
|---------|---------|--------------|-----------|
| 1890..  | 27.21   | 26.10        | 26.47     |
| 1891..  | 23.62   | 26.09        | 28.17     |
| 1892..  | 29.29   | 26.75        | 27.95     |
| 1893..  | 24.73   | 25.44        | 27.42     |
| 1894    | 23.34   | 23.48        | 24.81     |
| 1890-94 | 25.60   | 25.54        | 26.94     |

The mean death rate of Newark for the period 1890-94 is almost identical with the rate for Jersey City, and 1.5 per 1,000 below the rate for New York. According to Dr. Billings the mean rate for New York for 1885-90 was 27.66 and for Brooklyn 24.17. Much to my regret, it is not possible for me to give a rate for Newark for that period. For 1894, it will be observed, Newark had the lowest rate of the three cities compared in the preceding tables. A comparison of mere gross death rates, however, is not a reliable method, since the differences in the age distribution of the population of the different cities seriously affect the general death rates. This element of error is overcome by calculating the mortality on the number of persons living at specific groups of ages. This has been done in the next table, in which the death rates are given for ten different groups of ages. In part this table is estimated, since the detailed information in regard to the age distribution of the population in 1890 has not as yet been made public.

POPULATION, MORTALITY AND DEATH RATES FOR VARIOUS GROUPS OF AGES

(Per 1,000 living at same ages.)

| Ages        | Population. | Mortality. | Rate per 1 000. |
|-------------|-------------|------------|-----------------|
| 0 1         | 5,490       | 1,164      | 212.02          |
| 0 5         | 26,247      | 1,795      | 68.3            |
| 5 10        | 22,780      | 204        | 8.96            |
| 10 20       | 38,980      | 232        | 5.95            |
| 20 30       | 42,628      | 364        | 8.54            |
| 30 40       | 31,818      | 418        | 13.14           |
| 40 50       | 18,153      | 401        | 21.16           |
| 50 60       | 11,330      | 357        | 30.95           |
| 60 70       | 6,974       | 376        | 53.92           |
| 70 and over | 3,997       | 396        | 99.07           |
| Total ..... | 203,923     | 4,543*     | 22.28           |

\*For the calendar year ending December 31, 1894.

COMPARATIVE MORTALITY UNDER FIVE YEARS FOR SIX  
LEADING CITIES.

|                                   | Popu-<br>lation,* | Mor-<br>tality. | Rate per<br>1 000 |
|-----------------------------------|-------------------|-----------------|-------------------|
| Newark, 1894 . . . . .            | 26,247            | 1 804           | 68 39             |
| Jersey City, 1894 . . . . .       | 23,676            | 1,900           | 80 25             |
| New York, † 1885 90 . . . . .     |                   |                 | 109 48            |
| Brooklyn, † 1885 90. . . . .      |                   |                 | 93 42             |
| Boston, † 1885 90 . . . . .       |                   |                 | 94 42             |
| Philadelphia, † 1885 90 . . . . . |                   |                 | 82 83             |

\*Estimated †Reports of Dr. Billings

The method here employed has the advantage over a gross death rate, in that the effect of local climatic or sanitary conditions can be traced for each group of ages, which is of the greatest importance to the student of climatology and vital statistics. It will be observed that the child mortality in Newark is considerably below the child mortality of Jersey City and other cities with a much larger population. Newark in 1894 had only 1,795 deaths under five years to the 1,900 of Jersey City. The death rate under 5 is justly considered an almost infallible index of the sanitary condition of a community, and the result here shown is deserving of consideration. To make the most extended use of this table possible I have compiled from advance data of the Eleventh census a table of corresponding death rates for four cities for the year 1890, which will serve as a means of comparison of the Newark mortality at different groups of ages with the average mortality of other communities.

COMPARATIVE DEATH RATE OF NEWARK (1894 AND FOUR  
CITIES, 1890.

| Age Period.   | Newark. | Four Cities.* |
|---------------|---------|---------------|
| 0-1 . . . . . | 212.02  | 230 92        |
| 0-5 . . . . . | 68.39   | 72.74         |

\*Boston, Cincinnati, St. Louis and New Haven, Conn.

| Age Period | Newark | Four Cities* |
|------------|--------|--------------|
| 5-10       | 8.96   | 7.50         |
| 10-20      | 5.95   | 5.45         |
| 20-30      | 8.54   | 6.37         |
| 30-40      | 13.14  | 13.10        |
| 40-50      | 21.16  | 13.44        |
| 50-60      | 30.95  | 20.57        |
| 60-70      | 53.92  | 36.88        |

\*Boston, Cincinnati, St. Louis and New Haven, Conn.

According to this table there are distinct differences in the mortality rates of Newark and the combined mortality of four other cities used here as a standard of comparison. The Newark death rates are favorable for the age periods 0-5, 20-40 and 60-70, but unfavorable for the periods 5-20 and 40-60. Considering the large industrial population of Newark, the vast majority of which fall under this age group, it is remarkable that the mortality should be so favorable. A more extensive investigation would be necessary to disclose the causes of the higher mortality for Newark at the two periods for which the city rate is in excess of the combined mortality.

The death rates under one and under five years are exceptionally favorable and much below the rates for other cities and localities. For 1893 the rate for Boston, Mass., was 280 per 1000, for Providence, R. I., 272, for Eastern Massachusetts, 244, for Western Massachusetts, 237, for New York city 1890, 279, for Brooklyn, 1890, 255 per 1000 of population under one year of age against a Newark rate of only 212 per 1000.

All of these rates are considerably in excess of the Newark rate, and if this rate can be maintained, or, better still, be still further reduced, the general health of the city will be correspondingly favorable.

In regard to the prevalence of certain diseases, it is not possible at present to make a satisfactory comparison with the returns for other cities for 1894. The complete returns will not be available for some time to come, and I can make use of only a very few comparative statistics compiled from monthly reports. In the table below the death rates for five selected causes are given for Newark and New York, and for typhoid fever for Newark and Jersey City.

COMPARATIVE DEATH RATES FROM FIVE SPECIFIED CAUSES, 1894.

|                         | Newark.       |                          | New York.     |                          |
|-------------------------|---------------|--------------------------|---------------|--------------------------|
|                         | Actual death. | Per 100,000 of popula'n. | Actual death. | Per 100,000 of popula'n. |
| Consumption . . . . .   | 515           | 252.55                   | 4,687         | 282.36                   |
| Diphtheria . . . . .    | 180           | 88.37                    | 2,371         | 142.77                   |
| Typhoid fever . . . . . | 34            | 16.67                    | 325           | 19.58                    |
| Smallpox . . . . .      | 18            | 8.83                     | 156           | 9.39                     |
| Diarrhoeal dis. . . . . | 337           | 165.25                   | 3,043         | 183.32                   |

The specific death rates shown in this table are without exception favorable to Newark in comparison with New York city. The low rates for typhoid fever and diphtheria are especially deserving of consideration.

The mortality from typhoid fever is considered strictly preventible and that of diphtheria largely so and the position of Newark in this respect, especially in comparison with Jersey City, is exceptionally favorable. The table below shows the actual mortality from typhoid fever for Newark, Jersey City and New York, for the year 1894 as well as the corresponding death rates per 100,000 of population.

COMPARATIVE MORTALITY FROM TYPHOID FEVER, 1894

|                       | Deaths. | Per 100,000 |
|-----------------------|---------|-------------|
| Newark . . . . .      | 34      | 16.67       |
| Jersey City . . . . . | 119     | 64.69       |
| New York . . . . .    | 325     | 19.58       |

I regret that it has not been possible for me to make a more extended investigation of the vital statistics of the city. A study of the abundant statistical material would no doubt bring forward many interesting and valuable facts in regard to the sanitary condition of the city, as well as in regard to the effect of local sanitary measures. The result of this investigation would seem to prove that the general health of the city is good, the mortality for specified groups of ages and for certain selected causes below the average, and finally that there has been an improvement in the death rate during recent years.

Sincerely yours,

FREDERICK L. HOFFMAN.

## FINANCIAL REPORT.

---

Detailed statement of money expended by the Board of Health for the year ending December 31, 1894 :—

### SANITARY DEPARTMENT.

|   |            |
|---|------------|
| Medical Officer of Health, salary.  | \$2,500 00 |
| Supersntendent of Sanitary Department, salary                                   | 1,500 00   |
| Attorney (four months and seven days), salary                                   | 388 06     |
| Chemist, salary, . . . . .  | 750 00     |
| Clerk, salary . . . . .   | 1,000 00   |
| Typewriter, salary . . . . .  | 399 30     |
| Meat inspectors (2). (These inspectors furnish their own conveyances) . . . . . | 2,000 00   |
| Plumbing inspectors (2) . . . . .   | 2,000 00   |
| Milk inspector . . . . .  | 782 50     |
| Sanitary police (16) . . . . .  | 12,126 25  |
| Janitress . . . . .   | 180 00     |
| Office rent . . . . .   | 799 92     |
| Amount paid physicians for reporting infectious diseases. . . . .               | 441 00     |
| Petty cash . . . . .  | 200 00     |
| Printing and stationery . . . . .   | 809 99     |
| Rent of telephones. . . . .   | 30 00      |
| Light for office . . . . .  | 89 85      |
| Coal. . . . .   | 23 55      |
| Repairing office furniture . . . . .  | 9 25       |
| Incandescent lamps. . . . .   | 16 04      |
| Disinfectants . . . . .   | 63 64      |
| Typewriter supplies . . . . .   | 2 35       |
| Advertising . . . . .   | 3 50       |
| Carpenter work in office . . . . .  | 41 20      |
| Paint. . . . .  | 4 30       |
| William Whalen (constable fees). . . . .  | 6 47       |
| Removing telephone, etc., . . . . .   | 10 75      |

|   |             |
|---|-------------|
| American Public Health Association . . . . .  | \$5 00      |
| One year's subscription for Annals of Hygiene . . . . .                                   | 2 00        |
| One City Directory . . . . .  | 5 00        |
| Professor George C. Sonn, meteorological reports . . . . .                                | 28 00       |
| Electric light shades . . . . .   | 7 00        |
| Engineering Record, one year's subscription . . . . .                                     | 5 00        |
| Stoves and fixtures for office . . . . .  | 40 00       |
| Ice for office . . . . .  | 10 80       |
| Insurance, office furniture. . . . .  | 31 00       |
| Kohn case (judgment against Meat Inspector Wolz) . . . . .                                | 15 00       |
| Expenses to Philadelphia, Pa., inspection of hospitals and disinfecting station . . . . . | 70 00       |
| Expenses to the meeting of American Public Health Association . . . . .                   | 50 00       |
| Plumbing work at No. 78 William street, by order of Board of Health . . . . .             | 234 00      |
| Drilling milk sample bottles. . . . .   | 1 20        |
| Transcript of testimony Kohn case (ordered by the court) . . . . .                        | 41 90       |
| Expressage. . . . .   | 2 75        |
| Cabinet (Tucker File Company) . . . . .   | 35 00       |
| Washing towels for office . . . . .   | 6 30        |
| One flash gas stove. . . . .  | 1 00        |
| Telegrams . . . . .   | 6 32        |
|   | <hr/>       |
|   | \$26,431 42 |

## DISPENSARY.

|  |            |
|--|------------|
| Apothecary's salary . . . . .                                | \$1,200 00 |
| Apothecary's assistant, salary (part of year only) . . . . . | 325 00     |
| Janitress, salary . . . . .                                  | 180 00     |
| District physicians' salary (10) . . . . .                   | 4,000 00   |
| Drugs. . . . .   | 2,397 24   |
| Dentists' salary . . . . .                                   | 150 00     |
| Liquors . . . . .  | 229 95     |
| Gaslight . . . . .   | 12 49      |
| Ice . . . . .  | 44 20      |
| New Jersey Purifying Co. (rent of filter) . . . . .          | 9 00       |
| Surgical instruments . . . . .                               | 14 47      |
| Printing and stationery and new books . . . . .              | 186 00     |
| Plumbing work . . . . .                                      | 27 25      |
| Coal . . . . .   | 48 00      |
| Cabinet and bandages . . . . .                               | 23 98      |
| Keys, locks, etc . . . . .                                   | 1 75       |



|   |            |
|---|------------|
| Living dispensary and hallway . . . . . | \$10 10    |
| Refrigerating furniture . . . . .       | 4 50       |
| Refrigerating urnal. . . . .            | 3 65       |
| City directory . . . . .                | 5 00       |
|   | <hr/>      |
|   | \$8,923 53 |

## SMALLPOX EXPENSES TO DECEMBER 31, 1894.

|   |            |
|---|------------|
| Superintendent of Smallpox Hospital . . . . .   | \$ 390 00  |
| Nurse of Smallpox Hospital. . . . .   | 532 00     |
| Cook and laundress . . . . .  | 305 80     |
| Orderlies, two . . . . .  | 675 00     |
| Medical attendance. . . . .   | 1,238 00   |
| Medical officers (2), quarantine duty . . . . .                                       | 400 00     |
| Special officers on quarantine (guard) duty . . . . .                                 | 10,328 25  |
| Vaccine . . . . .   | 1,760 00   |
| Consultations . . . . .   | 51 00      |
| Board of smallpox patients (Poor and Alms Committee of Com-<br>mon Council) . . . . . | 1,940 41   |
| Refrigerating goods (disinfecting corps) . . . . .                                    | 26 30      |
| Coal and wood . . . . .   | 140 20     |
| Stoves and fixtures . . . . .   | 44 65      |
| Kitchen utensils. . . . .   | 14 55      |
| Shoes (jail patients) . . . . .   | 10 20      |
| Sundry Supplies Smallpox Hospital . . . . .   | 9 17       |
| Goods destroyed (W. E. Lewis) . . . . .   | 24 00      |
| Goods destroyed (J. B. Price) . . . . .   | 18 00      |
| Goods destroyed (Francis Patterson) . . . . .   | 10 25      |
| Groceries supplies for quarantined houses during smallpox . . . . .                   | \$2 100 67 |
| Meat . . . . .  | 706 24     |
| Fish, . . . . .   | 90 46      |
| Tobacco . . . . .   | 82 40      |
| Milk, . . . . .   | 72 40      |
| Fodder. . . . .   | 6 96       |
| Outfit disinfecting corps . . . . .   | 16 95      |
| Disinfectants . . . . .   | 39 01      |
| One ave . . . . .   | 1 00       |
| Ice . . . . .   | 23 07      |
| Rent for store, commissary department (55 River street) . . . . .                     | 54 85      |
| Hospital tents. . . . .   | 343 07     |
| Carpenter work . . . . .  | 160 76     |

|   |                   |
|---|-------------------|
| Water rent .....  | \$17 40           |
| New door for Smallpox Hospital  | 4 85              |
| Bedding   | 15 00             |
| Paint, whitewash, etc , etc   | 38 86             |
| Feed of horse   | 16 82             |
| Drugs   | 95 58             |
| Undertakers' charges.....   | 23 00             |
| Replacing goods destroyed on account of being infected with<br>smallpox ..... | 668 76            |
| Horse, wagon and carriage hire  | 998 80            |
| Repair of ambulance   | 2 10              |
| Vaccination   | 5 00              |
| Newspapers  | 4 08              |
| Clothing, etc., furnished discharged patients, etc                            | 1 047 83          |
| Liquors   | 13 00             |
|   | <hr/> \$24 572 69 |

RECEIPTS FOR THE YEAR ENDING DECEMBER, 1894.

|                    |                  |
|--------------------|------------------|
| Filing plans. .... | \$2,082 00       |
| Scavenger permits  | 145 20           |
| Animal permits     | 126 90           |
| Scavenger licenses | 300 00           |
| Fines              | 90 00            |
|                    | <hr/> \$2,744 10 |

All other fines deposited to the credit of the city of Newark.

## Laboratory of Herbert B. Baldwin.

NEWARK, N. J., Dec. 31, 1894.

*To the Honorable Board of Health of the City of Newark.*

GENTLEMEN -I herewith submit my annual report as Chemist of the Board for the year ending December 31st, 1894.

Since my last annual report the work in my department has largely increased, both in amount and importance. The daily progress in sanitary science, the sophistication of food products due to the constant increase in competition, and the various questions of a chemical nature concerning the nuisances inherent to a large manufacturing city are rapidly widening the scope of chemistry in public health work.

The contents of this report are arranged under the heads of water, milk, miscellaneous analysis and investigations of factory nuisances.

### WATER.

The chemical examination of well water has always formed the major part of the work of this department, and there is really no more important step toward sanitary advancement than the abandoning of contaminated wells. Indeed, it has been asserted that over ninety per cent. of all typhoid fever cases can be traced to either water or milk containing the germs of this disease, and it not infrequently happens that the bacilli are introduced

in the milk by its adulteration or contact with contaminated water.

It is a significant fact, as shown by the table of water analysis accompanying this report, that in over fifteen per cent of all the cases where these wells were used typhoid fever was or had been present, either on the premises or in the immediate vicinity, where neighbors so often make common property of a well.

#### CONTAMINATION OF WELLS.

The pollution of a well usually occurs through infiltration of water holding in solution organic matter derived from the privy vault, cesspool or stable. In cases where the well is widely remote from such points of contamination, is very deep, partly through rock or piped, the average individual insists that the water must of a necessity be pure, but analysis often proves the fallacy of such a conclusion. While it is true that in many of these cases, if the water gets a fair filtration through the ground, the danger of serious contamination is reduced to a minimum, there are so many ways by which surface or other drainage may reach such wells that the condition of their contents can only be determined by examination. For instance, a well may be wholly or partly built in rock, and the rock may have seams or fissures leading directly to some cesspool, perhaps quite some distance away; or the topography of the land may be such that waste thrown on the surface many yards off will be washed down to the mouth of the well; or, in the case of a piped well, the sewage may find its way to the pipe and gradually wash a channel next to its outside surface down to the bottom and then go directly into the water. Sometimes, and a few cases have already come under observa-

tion, a well may be situated on a premises where everything is connected with the sewer, but a break in the drainpipe may bring about a worse condition of affairs than before. Also, mere distance from all possible sources of contamination is not an absolute safeguard against it, for instances have occurred where, by means of colored solutions, springs or wells were found to have direct communication with the surface long distances away and where the water had had little or no filtration.

Notwithstanding the thousand and one chances the deadly microbe has for finding its way into our wells, it should not be inferred that all water from that source is bad. Although, on general principles, the city well may be declared unsafe, there have been quite a number found which analysis showed to be comparatively free from impurity.

#### WATER ANALYSIS.

It is frequently hard to draw a distinct line between what is ordinarily called pure and contaminated water. Strictly speaking there is no natural water that is absolutely pure, but as from a sanitary standpoint there are many substances normally found in water that have no harmful significance and since the object of these examinations was simply to determine its fitness for potable use, the analysis, except in particular cases, was confined to the determination of free and albuminoid ammonia, chlorine, nitrogen as nitrites and nitrogen as nitrates.

To make the significance of these terms more clearly understood a brief account of the chemical changes in a polluted water may be given.

Nitrogen is a very characteristic and constant constituent of sewage and animal waste. This by the aid of bacteria is gradually transformed by successive

stages from its existence in organic combination to harmless inorganic nitrates. First through decomposition of the nitrogenous or albuminoid matter the nitrogen is converted into ammonia; this ammonia is then oxidized to nitrites and these in turn are further oxidized to nitrates. Thus nitrogen in some one or all of the above forms affords a most valuable indication of a contaminated water.

Although the above is the theoretical and usual course of the nitrogen there are so many conditions that modify and determine the rapidity of these different changes from one state of oxidation to another that it is not always easy or possible to determine the character of a water from these data alone. Sometimes the ammonia may pass directly into the condition of nitrates without being first converted into nitrites or it may have gone through the different stages of oxidation in the usual manner and then be reduced back to ammonia again, or it may stop at any one of these stages for months and then suddenly pass to the next.

#### CHLORINE.

Chlorine, which forms about sixty per cent. of common salt, is another most useful factor for judging the pollution of water, as salt is a prominent constituent of house sewage.

While the determination of chlorine is a most useful and necessary one in water analysis it is surprising that so much importance has been attached to it by many. The reason for this, I think, is the ease and facility with which it may be estimated by physicians and others who have not the means for making a complete analysis.

There have been many wells pronounced unfit for use simply because they contained considerable salt.

Salt is a natural constituent of the ground and in the lower part of this city the normal amount is quite large. Besides this there are many chances for its accidental introduction into water. A very common cause is the emptying of ice cream freezers on the ground near the well. Several cases have come under my observation where people have put bags of salt in their wells with the idea of purifying the water.

#### BACTERIOLOGICAL EXAMINATION.

In regard to the application of bacteriology to the examination of water it may be said that in the present condition of our knowledge it is an excellent method for use in experimenting on systems of purification, and in particular cases becomes an important aid to the chemical tests, but alone its use is usually limited and unsatisfactory.

#### INTERPRETATION OF RESULTS.

It should be understood that none of the substances mentioned in these analysis are found in sufficient quantity in drinking water to be in the least detrimental in themselves, and their detection and estimation are only useful for indicating the past history and present condition of the organic matter. From the analytical data alone it is sometimes very difficult to form an opinion on the quality of a water and in such cases the environment of the well and any other information obtainable has to be taken into consideration. With all samples of water brought for analysis diagrams and descriptions of the wells have been furnished. These in numerous instances have been a valuable aid in writing an opinion.

In making reports the terms "passable," "suspicious," "very suspicious," "contaminated," "badly contaminated" and "very badly contaminated" have been adopted to approximately designate the degree of contamination, although in exceptional cases it is possible that a water marked suspicious or even passable would be more dangerous to use than a badly contaminated one.

Of the four hundred and twenty five wells represented in the table of analyses, the proportion of the different grades is graphically illustrated below:

|                                      |
|--------------------------------------|
| <i>Contaminated, 57.17 per cent.</i> |
| <i>Suspicious, 27.30 per cent.</i>   |
| <i>Passable, 15.53 per cent.</i>     |

#### TABLES.

The analyses of wells will be found in table No. 7, appended to this report. As they have never before been published or collectively reported I have included not only the results of water analyzed throughout the year, but also of samples examined in 1893 and a part of 1892.

Figures are not given for the nitrogen or nitrites, but the terms "small," "excessive" or "very excessive" indicate that the amount was less, more or very much more than .0005 parts per 100,000.

Should it be desired to convert the results into grains per United States gallon it may be done by multiplying them by the decimal .58318.

#### MILK.

This most important article of food does not receive the attention given it in some cities, notably those of



Massachusetts, in which State the requirements and regulations are much more stringent than here.

Our State standard simply requires twelve per cent of total solids, no regard being had to the amount of fat. This allows considerable latitude to those who are inclined to increase their profits by adding a little water or abstracting considerable cream. Either or both may be done with most good milk without making it fall below the standard.

Milk is such a universal article of diet, especially for infants and the sick, it would seem strange that more attention is not given to the regulation of its sale, and that it should be sold almost exclusively according to quantity and not quality. One man may purchase a quart of milk containing seventy-five per cent. more fat than the same amount bought by his neighbor at the same price, and yet in both cases it is above the standard and unadulterated. It is satisfactory to note that in some places attention is being given to this matter, and that the dealers realize that it is to their interest to separate their milk into two or more grades.

#### THE LACTOMETER.

So much has been said concerning the merits, and otherwise, of this instrument for testing milk that it will suffice to say that it has been the means employed by the inspector for selecting supposedly poor specimens for analysis. How well it has served the purpose in this respect is shown by the results of the analyses. However, the probabilities are that a number of adulterated milks have been missed by its use which would have been detected by taking all samples which looked in the least suspicious, without regard to the lactometer at all.

There have been twenty-two samples analyzed during the year, but two of which proved to be above the standard.

The analytical data will be found in the following table:—

| Sample<br>no. | Year  | Date<br>Received | Total<br>Solids | Water | Fat. | Solids<br>not fat | Remarks.           |
|---------------|-------|------------------|-----------------|-------|------|-------------------|--------------------|
| 23            | "     | 15               | 10.26           | 87.74 | 3.10 | 7.16              | Below the standard |
| 24            | March | 15               | 11.44           | 88.56 | 3.26 | 8.18              | " "                |
| 25            | "     | 18               | 11.88           | 86.12 | 3.72 | 8.16              | " "                |
| 26            | April | 18               | 10.55           | 83.45 | 2.84 | 8.01              | " "                |
| 27            | "     | 24               | 11.14           | 88.86 | 2.70 | 8.35              | " "                |
| 28            | April | 26               | 11.04           | 88.96 | 2.80 | 8.18              | " "                |
| 29            | May   | 5                | 11.41           | 88.59 | 3.37 | 8.04              | " "                |
| 30            | June  | 20               | 11.02           | 88.98 | 2.65 | 8.37              | " "                |
| 31            | July  | 11               | 11.17           | 88.05 | 3.10 | 8.78              | " "                |
| 32            | "     | 13               | 11.14           | 88.86 | 2.64 | 8.50              | " "                |
| 33            | "     | 23               | 11.33           | 88.67 | 2.74 | 8.59              | " "                |
| 34            | Aug.  | 11               | 11.45           | 85.55 | 3.24 | 8.21              | " "                |
| 35            | "     | 13               | 11.37           | 88.63 | 3.20 | 8.17              | " "                |
| 36            | "     | 17               | 11.67           | 86.33 | 1.71 | 8.96              | " "                |
| 37            | "     | 20               | 10.49           | 86.51 | 2.03 | 7.86              | " "                |
| 38            | Aug.  | 27               | 11.11           | 88.89 | 2.05 | 8.16              | " "                |
| 39            | Aug.  | 27               | 12.35           | 87.05 | 3.87 | 8.48              | Above the standard |
| 40            | Aug.  | 28               | 10.01           | 89.90 | 2.12 | 7.99              | Below the standard |
| 41            | "     | 31               | 12.12           | 87.88 | 3.60 | 8.73              | Above the standard |
| 42            | "     | 31               | 9.25            | 90.75 | 2.53 | 6.52              | Below the standard |
| 43            | Sept. | 28               | 11.40           | 88.60 | 3.35 | 7.85              | " "                |
| 44            | Nov.  | 13               | 11.28           | 86.72 | 2.05 | 7.33              | " "                |

#### MISCELLANEOUS ANALYSES.

Under this head are included such analyses as have not been mentioned in the tables for water and milk.

#### SARDINES.

The remains of a box of mustard sardines which were supposed to have poisoned some of those who ate them were analyzed, but nothing was found except a trace of tin.

## BRANDY DROPS.

These candies had the appearance of chocolate cream drops, but were flavored strongly with brandy. Two kinds were analyzed and found to be filled with sugar syrup containing about five per cent. of brandy. It is not likely that enough would be eaten to cause intoxication, but by their use children might acquire a taste for liquor.

## CONDENSED MILK.

A suspected can of condensed milk was examined for tyrotoxicon, but as the milk kept well and both chemical and physiological tests failed to discover it it was concluded that it was absent.

## DISINFECTANTS

Two brands of disinfectants for sale on the market were examined and neither found to be up to the standard claimed for it; in fact one was of very little value at all. A sample of carbolic acid was tested and found to be ninety per cent. pure.

## OTHER SAMPLES OF WATER.

Water from a deep well in use at the Essex County Insane Asylum and two samples of city water were analyzed and found to be of excellent quality, although it would be better if the city water contained less albuminoid ammonia.

Examination of a sample of water taken from an old pipe discharging into the canal proved it to be a part of our regular supply.

## INVESTIGATIONS OF FACTORY NUISANCES.

During the year complaint was made that a man in the employ of the Essex Lead Works had been poisoned

by lead fumes while working at an apparatus used in the manufacture of lead pipe. Investigation showed the complaint to have been entirely unwarranted and no fault, from a sanitary point of view, could be found with the apparatus, and from the nature of the process it it was not possible for any lead fumes to arise.

Several visits were made to a refinery conducted by D. R. Downer to find some way of overcoming a nuisance caused by smoke and bad odors from the slow burning of photographic waste. This was finally partly abated by a different arrangement and extension of the chimneys.

Some residents near the Cooper Chemical Works claimed that acid fumes from the establishment destroyed vegetation in their gardens and ruined their eyesight. A number of inspections confirmed the fact of the escape of acid vapors which, when the wind was from a certain direction, were very objectionable, but just what damage they caused could not be ascertained. The firm made some improvements in the arrangement of their acid plant and the trouble was obviated to a great extent.

In conclusion I wish to take the opportunity of expressing my appreciation of the many valuable suggestion of the Health Officer and especially for the reports containing special information about the wells which have often been indispensable in making the analytical reports.

Very respectfully,

HERBERT B. BALDWIN,  
*Chemist.*

---

# APPENDIX.

## *TABLES.*

---





MAP  
OF  
THE CITY OF  
**NEWARK**  
STATE OF  
NEW JERSEY

Diphtheria and Smallpox.







# BIRTHS REPORTED DURING THE YEAR 1894.

| CITY   |        | SEX      |      | NATIVITY OF PARENTS |            |         |         |             |                      |                     |                                |    |                                 | NAME OF CHILD |         | LEGITIMACY |             |               |
|--------|--------|----------|------|---------------------|------------|---------|---------|-------------|----------------------|---------------------|--------------------------------|----|---------------------------------|---------------|---------|------------|-------------|---------------|
| Total. | White. | Colored. | Male | Female              | Not Stated | Native. | Foreign | Not Stated. | Foreign Father only. | Foreign Mother only | Nativity of Father only Stated |    | Nativity of Mother only Stated. |               | Stated. | Not Stated | Legitimate. | Illegitimate. |
| 5194   | 5096   | 98       | 2631 | 2561                | 12         | 2334    | 471     | 320         | 3                    | 5                   | 30                             | 19 | 7                               | 3245          | 1949    | 5135       | 56          |               |

LL

## STILL BIRTHS REPORTED.

| SEX.   |      |         |             | FATHER. |          |             | MOTHER  |         |             | COLOR. |          |
|--------|------|---------|-------------|---------|----------|-------------|---------|---------|-------------|--------|----------|
| Total. | Male | Female. | Not Stated. | Native. | Foreign. | Not Stated. | Native. | Foreign | Not Stated. | White  | Colored. |
| 292    | 173  | 112     | 7           | 112     | 159      | 21          | 125     | 146     | 21          | 285    | 7        |

# MARRIAGES REPORTED.

## NATIVITY.

| Total. | White. |         | Colored. |         | Native. |         | Foreign. |         | Not Stated. |         | First Marriage. |         | Second Marriage. |         | Third Marriage. |         | Fourth Marriage. |         | Not Stated. |         |
|--------|--------|---------|----------|---------|---------|---------|----------|---------|-------------|---------|-----------------|---------|------------------|---------|-----------------|---------|------------------|---------|-------------|---------|
|        | Male.  | Female. | Male.    | Female. | Male.   | Female. | Male.    | Female. | Male.       | Female. | Male.           | Female. | Male.            | Female. | Male.           | Female. | Male.            | Female. | Male.       | Female. |
| 1630   | 1587   | 1588    | 43       | 42      | 726     | 962     | 697      | 636     | 9           | 34      | 1284            | 1288    | 195              | 158     | 12              | 7       | 0                | 0       | 142         | 177     |

# **NATIVITY OF DECEDENTS.**

|                      |              |
|----------------------|--------------|
| United States        | 3,216        |
| Ireland              | 488          |
| Canada               | 6            |
| Germany              | 555          |
| Russia               | 22           |
| Hungary              | 8            |
| England              | 103          |
| Austria              | 22           |
| Switzerland          | 11           |
| Turkey               | 1            |
| Italy                | 34           |
| Scotland             | 20           |
| France               | 12           |
| Ireland              | 16           |
| Holland              | 2            |
| Sweden               | 6            |
| Belgium              | 1            |
| China                | 1            |
| Denmark              | 5            |
| Greece               | 1            |
| Finland              | 1            |
| Not Stated           | 18           |
| <b>Native Born.</b>  | <b>3,216</b> |
| <b>Foreign Born</b>  | <b>1,309</b> |
| <b>Not Stated...</b> | <b>18</b>    |
| <b>Total</b>         | <b>4,543</b> |

# **DEATHS IN INSTITUTIONS,**

FOR THE YEAR 1894.

|  |            |
|--|------------|
| City Hospital                          | 165        |
| German Hospital...                     | 57         |
| St. Barnabas                           | 49         |
| St. Michaels                           | 191        |
| City Alms House                        | 28         |
| Home for the Aged                      | 5          |
| Essex County Hospital for the Insane   | 40         |
| " " Jail                               | 2          |
| Home of the Little Sisters of the Poor | 35         |
| Christian Refuge                       | 5          |
| Home for Incurables                    | 2          |
| The Eye and Ear Infirmary              | 1          |
| House of the Good Shepard              | 3          |
| Isolation Hospital                     | 18         |
| Home of the Friendless                 | 1          |
| St. Peters Orphan Asylum               | 1          |
| <b>Total Deaths in Institutions</b>    | <b>603</b> |



[illegible]









ORDER IV.

[illegible]

ORDER V.

[illegible]

Tabulated Statement of Deaths for the Year 1894, Classification and Enumeration  
of Causes. CONTINUED.

[illegible]

|              |   |   |   |   |   |
|--------------|---|---|---|---|---|
| End metritis | 1 | 1 | 1 |   |   |
| Endometritis | 2 | 2 |   | 1 | 1 |
| Endometritis | 1 | 1 |   |   |   |
| Endometritis | 3 | 3 |   | 1 | 1 |
| Endometritis | 1 | 1 |   |   |   |
| Endometritis | 1 | 1 |   |   |   |
| Endometritis | 1 | 1 |   |   |   |
| Endometritis | 1 | 1 |   |   |   |
| Endometritis | 2 | 2 |   |   |   |
| Endometritis | 1 | 1 |   |   |   |
| Endometritis | 2 | 2 |   |   |   |
| Endometritis | 7 | 7 |   | 1 | 1 |
| Endometritis | 2 | 2 |   |   |   |
| Endometritis | 1 | 1 |   |   |   |

ORDER IX.

Diffuse Abscess of Thigh .....

**ORDER !**

[illegible]



CLASS VIII

[illegible]



# ACTUAL MORTALITY.

BY DISTRICTS REPRESENTING OLD WARDS.

*From Zymotic and Other Chief Causes.*

| ESTIMATED POPULATION.       | 8565 | 7953 | 7137 | 6729 | 6118 | 28957 | 10400 | 22024 | 7953 | 15498 | 13255 | 22024 | 30990 | 6322 | 9992 | Total   |
|-----------------------------|------|------|------|------|------|-------|-------|-------|------|-------|-------|-------|-------|------|------|---------|
|                             |      |      |      |      |      |       |       |       |      |       |       |       |       |      |      | 203,923 |
| Wards                       | 1    | 2    | 3    | 4    | 5    | 6     | 7     | 8     | 9    | 10    | 11    | 12    | 13    | 14   | 15   |         |
| All Causes, All Ages, . . . | 204  | 153  | 113  | 162  | 126  | 660   | 263   | 476   | 132  | 307   | 342   | 536   | 710   | 153  | 204  | 4,543   |
| All Causes, under 5 Years   | 30   | 41   | 29   | 61   | 43   | 291   | 89    | 210   | 20   | 136   | 88    | 255   | 365   | 37   | 100  | 1,795   |
| Small pox                   |      |      |      | 9    |      |       |       | 2     |      | 3     |       | 3     | 1     |      |      | 18      |
| Measles . . . . .           | 1    | 4    | 1    | 4    |      | 2     | 1     | 10    |      | 6     |       | 12    | 2     | 1    | 5    | 49      |
| Scarlatina . . . . .        |      | 2    |      | 4    | 2    | 9     | 3     | 9     | 10   | 6     | 10    | 9     | 7     | 7    |      | 69      |
| Diphtheria                  | 1    | 4    | 3    | 3    | 2    | 33    | 7     | 12    | 1    | 15    | 12    | 13    | 62    | 4    | 8    | 180     |
| Whooping Cough              | 1    | 1    | 1    | 2    | 2    | 7     |       | 9     | 1    | 2     | 1     | 9     | 6     |      | 2    | 44      |
| Typhoid . . . . .           | 2    | 2    | 2    | 1    | 1    | 5     | 2     | 1     | 2    | 1     | 2     | 7     | 2     | 3    | 1    | 34      |
| Malarial Fever.             |      | 1    |      |      |      | 2     |       |       |      | 2     | 2     | 3     | 4     |      | 2    | 16      |
| Diarrhoeal Diseases         | 6    | 6    | 6    | 5    | 5    | 83    | 10    | 33    | 4    | 15    | 20    | 30    | 76    | 9    | 28   | 337     |
| Tuberculosis (Pulmonary)    | 33   | 24   | 15   | 20   | 13   | 73    | 33    | 56    | 17   | 30    | 29    | 57    | 70    | 12   | 23   | 515     |
| Cerebro Spinal Meningitis   |      |      | 1    |      | 1    | 4     |       | 3     | 2    | 2     | 2     | 3     | 3     | 1    | 1    | 23      |
| Other Zymotic Diseases      |      | 4    | 1    | 2    | 1    | 5     | 1     | 5     |      | 1     | 1     | 5     | 20    | 1    |      | 47      |
| Marasmus                    | 4    | 4    | 3    | 13   | 3    | 30    | 15    | 7     | 2    | 11    | 4     | 27    | 26    | 5    | 9    | 153     |
| Bronchitis                  | 1    | 2    | 3    | 4    | 2    | 9     | 4     | 18    |      | 5     |       | 9     | 10    | 3    | 4    | 77      |
| Pneumonia                   | 28   | 20   | 16   | 21   | 20   | 58    | 35    | 37    | 15   | 35    | 38    | 54    | 85    | 12   | 14   | 488     |



# WELLS RECORDED.\*

PRIVY VAULT AND CESS  
POOLS WITHIN

| LOCATION OF WELL       | SAMPLE NO. | KIND AND DEPTH.  | FOR MANUFACT'G OR DOM. PURPOSES | 30 FEET                | 50 FEET                | 100 FEET | RESULT OF ANALYSIS                      |
|------------------------|------------|------------------|---------------------------------|------------------------|------------------------|----------|---|
| Academy St 80-82       | 215        | Pump 20 Feet     | Domestic                        | 2 P. V.                |                        |          | badly Contam.                           |
| " 119.....             | 187        | Bucket 20'       | "                               | 1 } 2 C. P.<br>1 P. V. | .....                  | .....    | " "                                     |
| Aqueduct St 94 . . . . | 99         | "                | "                               | .....                  | 1 P. V.                | .....    | " "                                     |
| " 110-115½             | 101        | Pump 20'         | "                               | 1 } 1 C. P.<br>1 P. V. | "                      | .....    | " "                                     |
| " 114, 114½..          | 126        | Bucket 30'       | "                               | 2 P. V.                | .....                  | .....    | " "                                     |
| " 116, 118 ..          | 127        | "                | "                               | "                      | .....                  | .....    | .....                                   |
| " 120-122              | 128        | "                | "                               | "                      |                        |          | Suspicious Reanalyse<br>Very Suspicious |
| " 124. . . .           | 129        | Driven Wells 35' | "                               | "                      | .....                  | .....    | Very Badly Contam                       |
| " 130 . . . .          | 130        | Bucket 35'       | "                               | 2 P. V.                |                        |          | "                                       |
| " 174 . . . .          | 204        | "                | "                               | .....                  | .....                  | 1 P. V.  | Very Suspicious,                        |
| " 133.....             | 32         | Pump 35'         | "                               | .....                  | 2 } 2 C. P.<br>1 P. V. | 2 P. V.  | " "                                     |
| Adams St 109           | 22         | Bucket 15'       | "                               | 3 P. V.                |                        |          | Very Badly Conta                        |
| " 40-42.....           | 137        | "                | "                               | 1 } 1 C. P.<br>1 P. V. | .....                  | 1 P. V.  | " "                                     |
| " 108-122              | 163        | Pump 14'         | Mig an. Dom                     | .....                  |                        |          | Suspicious                              |

\*1y, head, use, which occurred or premises found in Chief Clerk's Table of amount of space

|                     |     |                  |             |                    |                     |  |
|---------------------|-----|------------------|-------------|--------------------|---------------------|--|
| Adams St 33.        | 239 | Bucket 12'       | Domestic    | { 1 C P<br>1 P V   | .. . .              | Very Badly Contam  |
| " 21.....           | 245 | Pump 18'         | "           | { 1 C P.<br>1 P V  |                     | " "  |
| " 64                | 63  | Bucket 18'       | "           | 1 C P              | 3 P V               | " "  |
| Alyea St 28         | 141 | " 40'            | "           |                    | 1 P V.              | Very Suspicious  |
| Alms House —        | 142 | Pump 40'         | "           |                    | 1 P. V              | Passable   |
| Ashland St 7 9      | 378 | " 25'            | "           | 2 P V.             | .. . .              | Contam   |
| Abeel St 10.....    | 392 | " 25'            | "           | { 1 C P<br>1 P V   | .. . .              | Very Badly Contam  |
| " 9                 | 406 | "                | "           | 1 P V              |                     | " "  |
| Astor St 41 43..... | 404 | Bucket 50'       | "           | .....              | { 1 C. P<br>1 P. V. | Passable   |
| Avon Ave 7..        | 445 | " 30'            | "           |                    | 1 P V               | Suspicious   |
| Baldwin St 35 41.   | 14  | Pump 28'         | Domestic    | 1 C P              | 2 P V               | Passable   |
| " 18                | 250 | " —              | "           |                    | 1 P V               | suspicious   |
| " 20                | 251 | Driven Well      | .....       |                    | 1 P V               | Badly Contam.  |
| Brunswick St 69     | 93  | Bucket 37'       | Domestic.   | .. . .             | 2 P V.              | "  |
| " 80                | 258 | " 30'            | "           |                    | 1 P V.              | Passable   |
| Broad St 329        | 82  | Pump —           | Domestic    | 1 P. V.            |                     | Contam   |
| " 416               | 64  | Driven Well 57'  | Mfg and Dom | { 1 C. P<br>1 P V. | { 2 P V<br>" "      | { Suspicious Re Area.<br>Analyzed Suspicious Re<br>Analyzed Contam |
| " 119               | 81  | Bucket —         | Domestic.   | .. . .             | 1 P V               | Passable   |
| " 283               | 98  | Driven Well 182' | "           | 1 P V.             |                     | "  |
| " 396               | 185 | Bucket 35'       | "           |                    | 1 P V.              | Badly Contam   |
| " 968 970 ..        | 195 | Pump —           | "           |                    | "                   | Passable   |
| Bergen St 159       | 82  | Bucket 64'       | "           | 1 P V.             |                     | Very Suspicious  |
| " 58 .....          | 244 | Pump 25'         | "           | .. . .             | 1 P V               |  |
| Bleecker st 154-156 | 44  | Bucket 25'       | "           | 1 P V.             | 2 P V.              | Badly Contam   |

# WELLS RECORDED.—CONTINUED.

| LOCATION OF WELL    | SAMPLE NO. | KIND AND DEPTH. | FOR MANUFACT'G OR DOM PURPOSES |  | PRIVY VAULT AND CESS-POOLS WITHIN |                            |                    | RESULT OF ANALYSIS  |
|---------------------|------------|-----------------|--------------------------------|--|-----------------------------------|----------------------------|--------------------|---------------------|
|                     |            |                 |                                |  | 0 FEET.                           | 50 FEET                    | 100 F'T.           |                     |
| Bleecker St opp. 11 | 199        | Pump            | Domestic                       |  |                                   | 2 C. P.                    | 2 C. P.<br>4 P. V. | Contaminated        |
| Bowery St 22        | 6          | Pump 30 Feet    | "                              |  |                                   | 1 P. V.                    |                    | Suspicious.         |
| Beaumont Ave 245    | 50         | Bucket 30'      | "                              |  | 1 P. V.                           |                            |                    | Badly Contaminated. |
| Belleville Ave 174  | 80         | Pump 80'        | "                              |  |                                   |                            | 1 P. V.            | Passable            |
| " 109.....          | 194        | Bucket 40'      | "                              |  | 1 C. P.                           | 1 P. V.                    |                    |                     |
| " 106-8 ....        | 359        | " 40'           | "                              |  | 2 P. V.                           |                            |                    | Suspicious.         |
| " 89 .....          | 414        | " 30'           | "                              |  |                                   | 2 P. V.                    |                    |                     |
| Bowery St 112       | 427        | Pump 20'        | "                              |  | 1 C. P.<br>1 P. V.                |                            |                    | Contaminated.       |
| Berlin St 79        | 123        | Bucket 15'      | "                              |  |                                   | 1 P. V.                    |                    | Badly Contaminated  |
| Barbara St 86 . . . | 139        | Pump 40'        | "                              |  | 1 Cow<br>Stable                   | 1 P. V.<br>1 Manure<br>Pit |                    | " "                 |
| " 100               | 390        | Bucket 15'      | "                              |  | 1 P. V.                           |                            |                    | Very Suspicious     |
| Broome St 33 35 ... | 168        | " 15'           | "                              |  | "                                 |                            |                    | Badly Contaminated  |
| " 247 .             | 262        | Pump 35'        | "                              |  |                                   | 1 P. V.                    |                    | " "                 |
| Burnet St 34 36     | 197        | Bucket 30'      | "                              |  |                                   | 2 "                        |                    | Passable.           |
| " 17 .              | 198        | Pump 30'        | "                              |  |                                   | 1 "                        | 1 P. V.            | Badly Contaminated. |
| Bank St 139 141 .   | 218        | Bucket 20'      | "                              |  |                                   | 2 "                        |                    | " "                 |
| " 520.....          | 383        | " 60'           | "                              |  | 1 P. V.                           |                            |                    | Suspicious          |
| " 273 . . . . .     | 389        | " 20'           | "                              |  | "                                 |                            |                    | Badly Contaminated. |

|                         |     |                    |           |            |         |                        |
|-------------------------|-----|--------------------|-----------|------------|---------|------------------------|
| Bank St 32-34 .....     | 394 | Bucket 25'         | Domest.c. | 1 P. V.    | 1 P. V. | Suspicious.            |
| " 143 145 .....         | 402 | " 19'              | "         | "          | 2 "     | Passable.              |
| Boyd St 167 .....       | 228 | " 30'              | "         | 1 P. V.    | "       | Contaminated.          |
| " 183 .....             | 439 | " 12'              | "         | "          | 1 P. V. | Badly Contaminated     |
| Barclay St 151 .....    | 261 | " 30'              | "         | 1 P. V.    | "       | "                      |
| " 108 .....             | 296 | " 30'              | "         | 1 "        | "       | "                      |
| " 131 .....             | 455 | " 25'              | "         | 1 "        | "       | "                      |
| Boyden Pl — .....       | 335 | Artesian Well 130' | "         | 2 "        | "       | Passable.              |
| Boyden St 131 133 ..... | 369 | Bucket 50'         | "         | 2 "        | "       | "                      |
| " 21 .....              | 395 | " 40'              | "         | 1 P. V.    | "       | Very Suspicious        |
| Bloomfield Ave 40½ 42   | 386 | " 45'              | "         | "          | "       | Suspicious             |
| Badger Ave 30 .....     | 416 | Pump 50'           | "         | 1 P. V.    | "       | Very Suspicious.       |
| Belmont Pl 13 .....     | 424 | Bucket 30'         | "         | 1 C. P.    | "       | Contaminated.          |
| Boston St 51 .....      | 447 | " 25'              | "         | 1 P. V.    | "       | Very badly Contamin'd  |
| Bremen St 18 20 .....   | 450 | Pump 38'           | "         | 1 C. P.    | 2 P. V. | Suspicious.            |
| " 22 ....               | 451 | Bucket 25'         | "         | 1 "        | 1 "     | "                      |
| Cartaret St 4 .....     | 78  | " 50'              | "         | "          | 2 "     | Passable.              |
| Condit St 29 .....      | 69  | " 49'              | "         | 3 P. V.    | "       | Very badly Contamin'd. |
| " 70 .....              | 149 | " 40'              | "         | 4 "        | "       | "                      |
| Crittident St 17-19 ... | 54  | " 40'              | "         | "          | "       | Very Suspicious. ....  |
| Columbia St 26 28 ..... | 5   | .....              | "         | 2 P. V.    | "       | Badly Contaminated ... |
| " 35 .....              | 268 | " 30'              | "         | 2 C. P.    | "       | "                      |
| Chambers St 76 .....    | 8   | Pump 20'           | "         | "          | 1 P. V. | "                      |
| Congress St 20-22 ...   | 212 | " 40'              | "         | Sao. Vault | 1 P. V. | Badly Contaminated     |
| " 63 .....              | 256 | Bucket 40'         | "         | 1 C. P.    | 1 C. P. | "                      |
| " 129 .....             | 270 | Pump 35'           | "         | 1 P. V.    | "       | Suspicious.            |
| " 130 .....             | 9   | Bucket 24'         | "         | 1 C. P.    | "       | "                      |
| " 133 ...               | 257 | " 40'              | "         | 2 P. V.    | "       | "                      |
| Concord St 15 21        | 10  | " 45'              | "         | 2 P. V.    | 2 P. V. | Contaminated.          |
|                         |     |                    |           | 1 C. P.    | 1 "     | Badly Contaminated.    |
|                         |     |                    |           |            | 2 P. V. | Passable.              |

# WELLS RECORDED, CONTINUED.

|                        |                   |                   |                                       | PRIVY VAULT AND CESS-<br>POOLS WITHIN |                  |         |                    |
|------------------------|-------------------|-------------------|---------------------------------------|---------------------------------------|------------------|---------|--------------------|
| LOCATION OF WELL       | SAM-<br>PLE<br>NO | WELL AND<br>DEPTH | FOR MANUFACT'G<br>OR<br>DOM. PURPOSES | NO. 1                                 | NO. 2            | NO. 3   | RESULT OF ANALYSIS |
| Centre Court 2 . . .   | 16                | .....             | Domestic.                             | { 3 P. V.<br>1 C. P.                  | .....            | .....   | Very Bad.          |
| Commerce St 87-89 ...  | 21                | 28'               | "                                     | .....                                 | .....            | .....   | "                  |
| " 161 ..               | 178               | Pump              | "                                     | { 1 P. V.<br>1 C. P.                  | .....            | .....   | Contaminated.      |
| " 183 185              | 184               | Bucket 25'        | "                                     | { 2 P. V.<br>2 C. P.                  | .....            | .....   | Badly Contaminated |
| " 187 189 ...          | 385               | " 25'             | "                                     | { 2 P. V.<br>2 C. P.                  | .....            | .....   | " "                |
| Crawford St 16 . . . . | 468               | " 26'             | "                                     | 1 P. V.                               | .....            | .....   | Contaminated.      |
| " 50 52 ....           | 23                | " 30'             | "                                     | .....                                 | .....            | .....   | Suspicious         |
| Court St 70-78 . . . . | 31                | Pump 25'          | "                                     | .....                                 | .....            | 3 P. V. | Passable           |
| Central Ave 106 108 .. | 275               | " 50'             | "                                     | .....                                 | .....            | 2 "     | Badly contaminated |
| " 113 . . .            | 182               | Bucket 35'        | "                                     | 1 P. V.                               | 1 P. V.          | .....   | " "                |
| " 182 . . .            | 37                | Pump              | "                                     | .....                                 | 1 "              | .....   | " "                |
| " 243 245              | 46                | " 11'             | "                                     | .....                                 | 2 "              | .....   | Contaminated       |
| Cross St 28            | 90                | Artesian 60'      | "                                     | 1 C. P.                               | { 1 "<br>1 C. P. | 1 "     | Badly Contaminated |
| Crane St 57            | 91                | Bucket 25'        | "                                     | .....                                 | .....            | 1 "     | Contaminated.      |

|                              |     |            |           |                      |                     |
|------------------------------|-----|------------|-----------|----------------------|---------------------|
| Crane St — . . . . .         | 102 | Bucket 60' | Domestic. | 1 P. V.              | Contaminated.       |
| Clinton Ave 395-397          | 124 | " 40'      | "         | 1 P. V.              | Passable            |
| Chestnut St 222 . . . . .    | 162 | Pump       | "         | 2 "                  | Badly Contaminated  |
| North Canal St 140 . . . . . | 179 | Bucket 30' | "         | { 1 P. V.<br>1 C. P. | " "                 |
| Coes Place 19                | 352 | " 35'      | "         | 1 P. V.              | Suspicious.         |
| " 30                         | 205 | Pump       | "         | "                    | Passable.           |
| Camp St 30                   | 224 | Bucket 35' | "         | 1 C. P.              | Badly Contaminated. |
| " 43                         | 372 | " 30'      | "         | 2 C. P.              | Passable.           |
| Clay St 1 . . . . .          | 208 | " 60'      | "         | 1 P. V.              | Contaminated        |
| " 3 . . . . .                | 301 | " 60'      | "         | 1 "                  | "                   |
| " 5 7 . . . . .              | 300 | " 60'      | "         | "                    | "                   |
| " 9 . . . . .                | 299 | " 60'      | "         | 1 C. P.              | Very Suspicious.    |
| " 44                         | 456 | " 40'      | "         | "                    | Passable.           |
| Canal St 85 . . . . .        | 440 | Pump       | "         | 1 "                  | Badly Contaminated. |
| Cherry St 26 . . . . .       | 441 | "          | "         | "                    | Suspicious.         |
| Camden St 138                | 328 | Bucket 45' | "         | 1 P. V.              | Badly Contaminated. |
| Clifford St 131 . . . . .    | 344 | Driven 28' | "         | 1 "                  | Contaminated.       |
| Drift St 25 . . . . .        | 34  | " 104'     | "         | 2 C. P.              | Badly Contaminated. |
| " 27 . . . . .               | 35  | " 150'     | "         | 8 P. V.              | Passable.           |
| Downing St 61 . . . . .      | 310 | Pump 16'   | "         | 1 "                  | Badly Contaminated  |
| Duryee St 22 22 . . . . .    | 225 | Bucket 25' | "         | 2 P. V.              | Contaminated.       |
| " 12 . . . . .               | 336 | Pump 15'   | "         | 1 "                  | Very Suspicious.    |
| Delancey St 66               | 340 | Bucket 10' | "         | "                    | "                   |
| " 75 . . . . .               | 342 | Pump 16'   | "         | "                    | "                   |
| " 144 . . . . .              | 341 | "          | "         | "                    | "                   |
| " 152 . . . . .              | 339 | "          | "         | 1 C. P.              | "                   |
| " 154 . . . . .              | 343 | "          | "         | 1 "                  | "                   |
| Dey St 12-14 . . . . .       | 331 | Bucket 18' | "         | { 1 P. V.<br>1 C. P. | Suspicious.         |
| Dark Lane 33 . . . . .       | 421 | " 27'      | "         | "                    | Passable            |
| Eighth Ave 33 35 . . . . .   | 116 | " 60'      | "         | 1 P. V.              | Suspicious.         |

# WELLS RECORDED. CONTINUED.

## PRIVY VAULT AND CESS POOLS WITHIN

| WELL               | SAMPLING<br>NO. | SINK OR<br>DEPTH. | FOR MANUFACT'G<br>OR<br>DOM. PURPOSES | PRIVY VAULT AND CESS<br>POOLS WITHIN |         |          | RESULTS OF ANALYSIS |
|--------------------|-----------------|-------------------|---------------------------------------|--------------------------------------|---------|----------|---------------------|
|                    |                 |                   |                                       | 30 FEET                              | 50 FEET | 100 FEET |                     |
| Log St Ave 59      | 110             | Dr. set 30'       | Dr. set                               |                                      | 1 P. V. | 1 P. V.  | Suspicious          |
| " 52-54            | 183             | " 25'             | "                                     |                                      | 2 "     | 2 "      | Contaminated        |
| " 46-48            | 184             | Pump 30'          | "                                     |                                      | 2 "     |          | Suspicious.         |
| " 69-71            | 115             | Bucket 42'        | "                                     |                                      | 2 "     |          | "                   |
| " 73-75            | 114             | "                 | "                                     |                                      |         |          | "                   |
| " 87-89            | 125             | " 50'             | "                                     | 1 P. V.                              |         | 1 "      | "                   |
| " 60-62            | 267             | " 30'             | "                                     |                                      |         | 1 "      | "                   |
| " 214              | 346             | " 30'             | "                                     |                                      |         | 2 "      | Badly Contaminated  |
| Elm St 129         | 146             | " 30'             | "                                     | 1 P. V.<br>1 C. P.                   |         |          | " "                 |
| 11th St 106-108    | 115             | Pump              | "                                     |                                      | 5 "     |          | Contaminated        |
| " 90-92            | 248             | Bucket 20'        | "                                     |                                      | 2 "     |          | Suspicious.         |
| " 95               | 316             | Pump 40'          | "                                     |                                      | 1 "     |          | Badly Contaminated  |
| " 152              | 426             | " 25'             | "                                     | 3 P. V.<br>1 C. P.                   |         |          | Contaminated        |
| Elm Road 52        | 160             | "                 | "                                     |                                      | 1 "     |          | Passable.           |
| Camett St 225-227  | 188             | " 24'             | "                                     | 1 P. V.                              |         |          | Contaminated        |
| " 172              | 62              | Bucket 21½'       | "                                     | 1 "                                  |         |          | Badly Contaminated. |
| East Park St 16    | 240             | Pump 40'          | "                                     |                                      |         |          | Very Suspicious.    |
| East Kinney St 235 | 280             | "                 | "                                     |                                      | 1 "     |          | Very Badly Contam.  |
| " 289              | 321             | Bucket            | "                                     | 1 "                                  |         |          | " " "               |
| " 291              | 320             | " 15'             | "                                     |                                      | 1 C. P. | 1 "      |                     |

|                           |     |              |                              |                    |                    |                    |
|---------------------------|-----|--------------|------------------------------|--------------------|--------------------|--------------------|
| East Kinney St 293        | 310 | Bucket 15'   | Domestic.                    | 1 C. P.            | 1 P. V.            | Contaminated       |
| " 239                     | 322 | " 15'        | "                            | "                  | 1 "                | "                  |
| Eighteenth Ave 220        | 473 | Pump 80'     | "                            | "                  | 1 P. V.            | Suspicious         |
| " 501                     | 419 | Bucket 35'   | "                            | 1 P. V.            | 1 "                | "                  |
| Front St 97 99            | 108 | Artesian 75' | Soda Water<br>Manufacturers. | "                  | 1 "                | "                  |
| " 51 83                   | 109 | Pump 30'     | Public                       | "                  | "                  | Suspicious.        |
| " 95                      | 177 | Driven 70'   | Manufacturing<br>Root Beer.  | "                  | 1 "                | "                  |
| " 21                      | 368 | Pump         | Domestic.                    | 1 P. V.<br>1 C. P. | "                  | Very Suspicious    |
| Fifteenth Ave 477         | 327 | Bucket 47'   | "                            | "                  | 1 "                | "                  |
| " 481                     | 347 | " 48'        | "                            | 2 P. V.            | "                  | Very Badly Contam. |
| " 473                     | 18  | " 58'        | "                            | Sewer<br>1 P. V.   | "                  | "                  |
| Fifteenth St 345          | 213 | Pump 55'     | "                            | "                  | 2 "                | Suspicious.        |
| Ferry St 252 254          | 138 | Bucket 30'   | "                            | 5 P. V.            | 1 C. P.            | Contaminated.      |
| " 277                     | 271 | " 17'        | "                            | 1 "                | 1 "                | Very Suspicious.   |
| " 110                     | 201 | Pump 30'     | "                            | "                  | Sanitary<br>Vault. | Very Badly Contam  |
| " 307                     | 332 | Bucket 13'   | "                            | "                  | 1 "                | "                  |
| Frankfort St 106          | 311 | " 14'        | "                            | 1 "                | "                  | Suspicious.        |
| Fifth Ave 34              | 172 | " 50'        | "                            | 1 C. P.<br>1 P. V. | "                  | "                  |
| Fifth Ave, cor Clifton av | 351 | " 71'        | "                            | "                  | 1 "                | "                  |
| Ferguson St 73            | 175 | " 18'        | "                            | 1 C. P.<br>2 P. V. | "                  | Very Badly Contam. |



# WELLS RECORDED.—CONTINUED.

|                       |            |                 |                                  | PRIVY VAULT AND CESS-<br>POOLS WITHIN |                    |           |                     |
|-----------------------|------------|-----------------|----------------------------------|---------------------------------------|--------------------|-----------|---------------------|
| LOCATION OF WELL.     | SAMPLE NO. | KIND AND DEPTH. | FOR MANUFACT'G OR DOM. PURPOSES. | 30 FEET.                              | 50 FEET.           | 100 FEET. | RESULT OF ANALYSIS. |
| First St 27           | 192        | Bucket 31'      | Domestic                         | 1 P. V.                               | 1 P. V.            |           |                     |
| First St 14 20        | 229        | Lump 35'        | "                                |                                       |                    | 1 P. V.   | Very Badly Contam.  |
| Green St 92-94.....   | 159        | Bucket 30'      | "                                | 2 C. P.<br>2 P. V.                    | .....              | .....     | Passable.           |
| Green St 163-165..... | 208        | " 40'           | "                                | .....                                 | 1 C. P.<br>1 P. V. | .....     | Contaminated.       |
| George St 81.....     | 214        | " 20'           | "                                | 1 P. V.                               | .....              | .....     | Very Badly Contam.  |
| Garden St 85.....     | 242        | " 18'           | "                                | .....                                 | .....              | 1 P. V.   | Contaminated.       |
| " 87                  | 234        | Pump 15'        | "                                | W C                                   | .....              | .....     | Very Badly Contam   |
| Gar. Isl. St 49       | 281        | Driven Well     | "                                | 1 C. P.                               | .....              | 1 "       | " "                 |
| " 61                  | 282        | " "             | "                                | 1 "                                   | .....              | 1 "       | Suspicious          |
| " 61 1/2              | 283        | " "             | "                                | 1 "                                   | .....              | 1 "       | Very Suspicious.    |
| " 63                  | 284        | " "             | "                                | 1 "                                   | .....              | 1 "       | " "                 |
| " 63 1/2              | 285        | " "             | "                                | 1 "                                   | .....              | 1 "       | Passable.           |
| " 65                  | 286        | " "             | "                                | 1 "                                   | .....              | 1 "       | " "                 |
| " 44                  | 307        | Bucket 15'      | "                                | .....                                 | 1 P. V.            | .....     | Very Badly Contam   |
| " 46                  | 308        | Pump            | "                                | .....                                 | 1 "                | .....     | Contaminated.       |
| " 48                  | 306        | " 23'           | "                                | 1 "                                   | 1 "                | .....     | Very Badly Contam.  |
| " 52                  | 309        | " "             | "                                | 1 "                                   | .....              | 1 "       | Very Suspicious.    |
| Haverden St 99        | 3          | " 30'           | "                                | .....                                 | 1 "                | .....     | Suspicious          |
| " 123.....            | 29         | " 27'           | "                                | 1 P. V.                               | .....              | .....     | Badly Contaminated. |
| " 121.....            | 39         | " 25'           | "                                | 1 "                                   | .....              | .....     | Very Suspicious.    |
| " 119                 | 42         | " 25'           | "                                | 1 "                                   | .....              | .....     | Passable            |
| " 117                 | 55         | " 25'           | "                                | .....                                 | .....              | .....     | Suspicious.         |

|                    |     |            |           |                    |  |
|--------------------|-----|------------|-----------|--------------------|--|
| Hunterdon St 103.  | 73  | Bucket 24' | Domestic. | 1 P. V.            | Contaminated.                          |
| Hudson St 114      | 226 | " 55'      | "         | 1 P. V.            | Passable                               |
| " 120.             | 220 | " 60'      | "         | 1 "                | Suspicious.                            |
| Hudson St 126-126½ | 219 | " 50'      | "         | 1 "                | Contaminated.                          |
| High St 13         | 57  | " 35'      | "         | 2 "                | 1 C. P.<br>3 P. V. Badly Contaminated. |
| High St 29-31      | 36  | " 20'      | "         | 2 C. P.<br>1 P. V. | 1 C. P. Very Badly Contam.             |
| High St 180        | 43  | " 35'      | "         | 1 P. V.            | Contaminated.                          |
| " 70               | 147 | Pump 42'   | "         | 1 P. V.            | 3 " Badly Contaminated.                |
| " 616              | 387 | Bucket 40' | "         | 1 "                | Passable.                              |
| Hermon St 56       | 7   | " 23'      | "         | 1 C. P.<br>1 P. V. | Badly Contaminated.                    |
| Hoyt St 43         | 49  | " 40'      | "         | 2 "                | 1 C. P.<br>1 P. V. " "                 |
| Halsey St 365 367  | 171 | " 25'      | "         | 1 "                | Very Badly Contam                      |
| " 299 301          | 206 | Pump       | "         | 2 "                | Suspicious.                            |
| " 283-285          | 207 | "          | "         | 2 "                | Very Suspicious.                       |
| Holland St 71-73   | 202 | " 46'      | "         | 1 "                | Suspicious                             |
| Hecker St 21       | 397 | Bucket 42' | "         | 1 C. P.<br>1 P. V. | Contaminated.                          |
| Jeliffe Ave 323    | 24  | " 15'      | "         | 1 "                | Passable.                              |
| Johnson St 14 16   | 145 | " 14'      | "         | 1 C. P.            | 2 " Badly Contaminated.                |
| " 22-24            | 428 | " 30'      | "         | 2 "                | Suspicious.                            |
| " 121              | 436 | " 20'      | "         | 2 C. P.<br>1 "     | 3 " Contaminated.                      |
| Jefferson St 40    | 230 | Pump 45'   | "         | Sanitary Vault.    | Suspicious.                            |

# WELLS RECORDED, -CONTINUED.

| LOCATION OF WELL.         | SAMPLE No. | KIND AND DEPTH | FOR MANUFACT'G OR DOM. PURPOSES. | PRIVY VAULT AND CESS-POOLS WITHIN |                    |          | RESULT OF ANALYSIS. |
|---------------------------|------------|----------------|----------------------------------|-----------------------------------|--------------------|----------|---------------------|
|                           |            |                |                                  | 50 FEET                           | 50 FEET            | 100 FEET |                     |
| Jefferson St 48           | 252        | Bucket 30'     | Domestic                         |                                   | 1 C. P.            | 1 P. V.  | Contaminated        |
| " 101.....                | 290        | " 40'          | "                                | .....                             | 1 P. V.            | .....    | Badly Contaminated. |
| John St 14                | 181        | " 30'          | "                                | 2 C. P.                           | 2 "                | .....    | Suspicious          |
| Kearny St 60              | 86         | Pump           | "                                | .....                             | 3 "                | .....    | Contaminated.       |
| " 62                      | 85         | "              | "                                | .....                             | 4 "                | .....    | Suspicious          |
| " 64                      | 87         | " 20'          | "                                | .....                             | 4 "                | .....    | "                   |
| Kearny St 66 68           | 88         | Pump           | "                                | 2 P. V.                           | .....              | .....    | "                   |
| West Kamey Pl 16 18       | 117        | Bucket 21'     | "                                | 2 C. P.<br>1 P. V.                | 1 P. V.            | .....    | Contaminated        |
| " " 22 . .                | 118        | Pump           | "                                | .....                             | 1 C. P.<br>2 P. V. | .....    | "                   |
| " " 26 . .                | 119        | "              | "                                | 1 C. P.                           | 1 P. V.            | .....    | "                   |
| Kossuth St 54 . . .       | 278        | Bucket 8'      | "                                | .....                             | .....              | 1 P. V.  | Very Badly Contam.  |
| Kossuth St 96 98 . . .    | 287        | Pump 15'       | "                                | .....                             | .....              | 1 "      | " " "               |
| " 97 97 1/2 . . .         | 238        | " 13'          | "                                | .....                             | .....              | 1 "      | " " "               |
| " 155                     | 409        | Bucket 14'     | "                                | .....                             | 1 C. P.            | .....    | " " "               |
| Longworth St 17           | 58         | " 30'          | "                                | 1 C. P.                           | 1 P. V.            | .....    | " " "               |
| " 10                      | 59         | " 30'          | "                                | .....                             | .....              | 1 P. V.  | Passable            |
| " 22-24                   | 363        | " 35'          | "                                | 1 P. V.                           | 1 P. V.            | .....    | Very Badly Contam.  |
| Lafayette St 128. . . . . | 143        | " 80'          | "                                | 1 P. V.                           | 1 "                | .....    | " " "               |

|                         |     |            |          |                      |                    |                            |
|-------------------------|-----|------------|----------|----------------------|--------------------|----------------------------|
| Lafayette St 116 118 .  | 365 | Pump       | Domestic | { 1 C P.<br>1 P. V.  | . . .              | Very Badly Contam          |
| Liberty St 26 . . . . . | 279 | " 35'      | "        | 1 C P                | 1 P V              | " "                        |
| " 28 . . . . .          | 166 | " 35'      | "        | { 1 "<br>1 P V       | 1 "                | Suspicious                 |
| Liberty St 40 48        | 164 | " 34'      | "        | { 1 C P.<br>1 P. V   |                    | ...                        |
| " 69                    | 232 | " 30'      | "        | 1 "                  |                    | Very Suspicious.           |
| " 50                    | 165 | " 35'      | "        | 3 "                  |                    | Badly Contaminated.        |
| " 36                    | 167 | " 35'      | "        | 1 C P.               | 1 P C              | " "                        |
| Littleton Ave 34 .      | 382 | Bucket 35' | "        | 1 P V                |                    | Suspicious.                |
| Montclair Ave 110 112   | 2   | " 25'      | "        | 1 C i                |                    | "                          |
| M. & E. R. R. Ave 45.   | 19  | Pump       | "        | { 1 "<br>1 P V       |                    | "                          |
| M. & E. R. R Ave 43     | 121 | Bucket 30' | "        |                      | { 2 C P<br>1 P V.  | 1 P V. Badly Contaminated. |
| M. & E. R. R. Ave 51-53 | 48  | Pump 35'   | "        | 1 P V.               |                    | 2 " " "                    |
| Main St 103 . . . . .   | 122 | " 30'      | "        | 1 "                  |                    | " "                        |
| Main St 53-55 . . . . . | 448 | Bucket 35' | "        | { 2 C. P.<br>2 P. V. |                    | " "                        |
| Monroe St 68 . . . . .  | 152 | " 50'      | "        |                      | { 1 C P<br>1 P. V. | " "                        |
| " 75 . . . . .          | 60  | Pump 18'   | "        | { 1 C. P.<br>1 P. V. |                    | " "                        |
| " 13 . . . . .          | 333 | Bucket 15' | "        | 1 C P.               | 1 P V.             | Contaminated.              |

# WELLS RECORDED,--CONTINUED.

| LOCATION OF WELL       | SAMPLE NO. | SINKING DEPTH. | FOR MANUFACT'G OR DOM. PURPOSES | PRIVY VAULT AND CESS POOLS WITHIN |                    |                    | RESULT OF ANALYSIS  |
|------------------------|------------|----------------|---------------------------------|-----------------------------------|--------------------|--------------------|---------------------|
|                        |            |                |                                 | 30 FEET.                          | 50 FEET.           | 100 FEET.          |                     |
| Marion St 22           | 345        | Bucket 18'     | Domestic.                       |                                   |                    | 1 C. P.<br>1 P. V. | Very Suspicious     |
| " 69 .....             | 356        | Pump           | "                               | 1 P. V.                           |                    |                    | Badly Contaminated  |
| " 71 .....             | 357        | Bucket 18'     | "                               |                                   | 1 C. P.<br>1 P. V. |                    | " "                 |
| " 60.....              | 367        | Pump 16'       | "                               | 1 C. P.<br>1 P. V.                |                    |                    | " "                 |
| Madison St 31 .        | 255        | Bucket 35'     | "                               | 1 C. P.<br>1 P. V.                |                    |                    | Very Suspicious     |
| " 27 .....             | 374        | Pump 23'       | "                               | 1 "                               |                    |                    | Badly Contaminated. |
| " 110 .....            | 349        | " 16'          | "                               |                                   |                    | 1 "                | Passable.           |
| " 112.....             | 348        | " 18'          | "                               |                                   |                    | 1 "                | "                   |
| " 108 .....            | 253        | Bucket 30'     | "                               |                                   | 1 C. P.<br>1 P. V. |                    | Contaminated.       |
| " 23.....              | 254        | " 50'          | "                               |                                   | 1 C. P.<br>1 P. V. |                    | Passable.           |
| Madison St 132-132½... | 429        | " 25'          | "                               | 1 C. P.<br>2 P. V.                |                    |                    | Contaminated.       |

|                        |     |            |
|------------------------|-----|------------|
| Mott & Passaic Aves .. | 155 | Pump       |
| Mulberry St 452. .     | 180 | Bucket 15' |
| " 456 $\frac{1}{2}$ .  | 247 | Pump 16'   |
| " 494 .                | 410 | " "        |
| " 450 . . .            | 446 | " 25'      |
| " 440 . . .            | 458 | " 30'      |
| Magazine St 03         | 265 | " "        |
| " 87 . .               | 206 | Bucket 12' |
| McWhorter St 67        | 317 | Pump 40'   |
| " 85                   | 318 | Bucket 30' |
| " 115 . .              | 457 | " 30'      |
| Monmouth St 94 .       | 417 | Pump 30'   |
| Morton St 44 . .       | 431 | " "        |
| " 22                   | 454 | " "        |
| Newark St 133 .        | 27  | Bucket 40' |
| " 105 .                | 314 | " 35'      |
| " 79                   | 324 | " 30'      |
| New St 349 . . . .     | 112 | " "        |
| New St 351-353 . . .   | 113 | " 35'      |
| " 428                  | 221 | " 50'      |
| " 348                  | 379 | " 34'      |
| " 365                  | 380 | " 25'      |
| Nassau St 34           | 174 | " 50'      |
| " 35-37. .             | 201 | " "        |
| Norfolk St 92-94.      | 437 | " 42'      |
| " 54-56 . . .          | 388 | " 30'      |
| " 157                  | 216 | " 50'      |
| New York Ave 113.      | 243 | " 30'      |
| " " 115                | 233 | Pump 25'   |
| " 263 .                | 277 | Bucket 12' |

# Domestic.

|   |   |         |        |         |                     |
|---|---|---------|--------|---------|---------------------|
| " | " | 1 P. V  | 1 P. V | 3 P. V  | Very Suspicious.    |
| " | " | "       | "      | "       | Contaminated.       |
| " | " | 1 C. P. | 1 "    | "       | Badly Contaminated. |
| " | " | "       | "      | 1 C. P. | Very Suspicious.    |
| " | " | 1 P. V. | "      | "       | Very Badly Contam.  |
| " | " | 1 C. P. | "      | 1 P. V  | Suspicious.         |
| " | " | "       | 1 "    | "       | Badly Contaminated. |
| " | " | "       | 1 "    | "       | " "                 |
| " | " | "       | 1 "    | 1 "     | Passable.           |
| " | " | "       | 1 "    | "       | Badly Contaminated. |
| " | " | "       | 1 "    | "       | Contaminated.       |
| " | " | 1 P. V  | "      | "       | "                   |
| " | " | "       | 1 "    | "       | "                   |
| " | " | "       | 4 "    | "       | "                   |
| " | " | 1 P. V. | "      | 1 P. V  | "                   |
| " | " | "       | "      | 2 "     | Contaminated.       |
| " | " | 1 "     | "      | 1 "     | "                   |
| " | " | 2 "     | "      | "       | Badly Contaminated. |
| " | " | 1 "     | "      | "       | Contaminated.       |
| " | " | "       | "      | 1 P. V. | Suspicious.         |
| " | " | "       | "      | "       | "                   |
| " | " | 1 C. P. | "      | "       | Passable.           |
| " | " | 1 P. V. | "      | "       | "                   |
| " | " | 2 "     | "      | "       | Badly Contaminated. |
| " | " | "       | "      | 1 P. V  | Suspicious.         |
| " | " | 1 "     | "      | "       | Contaminated.       |
| " | " | 1 "     | "      | "       | Badly Contaminated. |
| " | " | "       | 1 "    | "       | "                   |
| " | " | "       | 1 "    | "       | "                   |
| " | " | "       | 1 "    | "       | "                   |
| " | " | "       | 1 "    | "       | "                   |
| " | " | 1 C. P. | "      | "       | "                   |
| " | " | 1 P. V. | "      | "       | "                   |

# WELLS RECORDED. CONTINUED

## PRIVY VAULT AND CESS- POOLS WITHIN

| LOCATION OF WELL      | SAMPLE<br>No. | KIND AND<br>DEPTH. | FOR MANUFACTG<br>OR<br>DOM PURPOSES | 30 FEET        | 50 FEET         | 100 FEET | RESULT OF ANALYSIS  |
|-----------------------|---------------|--------------------|-------------------------------------|----------------|-----------------|----------|---------------------|
| Nesbitt St 18         | 338           | Pump 300'          | In nest                             |                |                 |          | Passable.           |
| N. J. R R Ave 247 1/2 | 308           | " "                | " "                                 |                | 1 P. V          | ....     | Badly Contaminated. |
| Oxford St 26          | 17            | Driven 30'         | " "                                 | 1 P V.         | ...             | .....    | Very Suspicious.    |
| " 34                  | 3             | Bucket 50'         | " "                                 |                | 1 P V           |          | Contaminated.       |
| Oxford St 75 77       | 408           | " 16'              | " "                                 |                |                 | 1 P V    | "                   |
| Ogden St 288 290      | 51            | " 40'              | " "                                 |                | 2 C P<br>2 P V  |          | "                   |
| " 343                 | 70            | " 25'              | " "                                 | 1 C P<br>1 P V |                 |          | "                   |
| " 397 399 ....        | 91            | Pump 30'           | " "                                 |                | 3 C P<br>3 P V  | 2 P V.   | Badly Contaminated. |
| " 394 395             | 12            | Bucket             | " "                                 |                | 1 C P<br>2 P V. |          | Contaminated        |
| Orange St 9 .....     | 304           | " 30'              | " "                                 |                | 3 P V.          |          | "                   |
| Orange St 344 348     | 323           | Pump 45'           | " "                                 |                | 1 "             |          | Contaminated.       |
| Polk St 126 128       | 4             | " "                | " "                                 |                | 1 "             |          | Badly Contaminated. |
| Prospect St 139       | 449           | Bucket 30'         | " "                                 |                |                 |          | Suspicious.         |
| " 133                 | 13            | " 26'              | " "                                 | 1 P V          |                 |          | Contaminated.       |
| Prospect Place 33..   | 13            | " 30'              | " "                                 | 3 C P<br>1 P V |                 |          | Badly Contaminated. |

|                               |     |            |          |         |         |                     |
|-------------------------------|-----|------------|----------|---------|---------|---------------------|
| Pacific St 189                | 14  | Bucket 15' | Domestic | 1 P. V. | ..      | Very Badly Contam.  |
| " 117                         | 28  | " 10'      | "        | 1 C P   | 1 "     | " "                 |
| Peshine Ave 99                | 15  | " 27'      | "        | 1 "     | 1 "     | Suspicious          |
| Peshine Ave 215 217           | 135 | " 37'      | "        | 2 P. V. | 1 C. P  | Very Suspicious.    |
| " 232                         | 443 | " 25'      | "        |         | 1 P V   | Badly Contaminated. |
| " 222-224                     | 444 | Pump 45'   | "        |         | 2 C P   | Very Suspicious.    |
|                               |     |            |          |         | 2 P V   |                     |
| Plane St 345                  | 25  | " 35'      | "        | 1 "     |         | Badly Contaminated. |
| " 146                         | 84  | " 25'      | "        |         |         | Suspicious          |
| " 179                         | 412 | " "        | "        | 1 P V.  |         | Contaminated.       |
| " 284                         | 415 | " "        | "        | ....    | 1 P V   | Passable.           |
| Pennington St 180.            | 74  | " "        | "        | ..      | 1 "     | Badly Contaminated. |
| " 115½                        | 136 | Bucket 15' | "        |         | 1 C P.  |                     |
|                               |     |            |          |         | 2 P V.  | Contaminated.       |
| " 121-123                     | 190 | " 15'      | "        |         | 2 "     | Suspicious          |
| " 113                         | 157 | " 17'      | "        |         | 2 C P   |                     |
|                               |     |            |          |         | 2 P V   | Badly Contaminated  |
| " 101 101½                    | 158 | " 15'      | "        |         | 1 "     | " "                 |
| Parker St 40                  | 133 | Pump       | "        | 3 P. V. | ....    | Contaminated.       |
| " 21                          | 134 | Bucket     | "        | 2 C P   | 3 P V   | Suspicious.         |
| Paterson St 25                | 180 | Pump 18'   | "        |         | 2 C.P.  |                     |
|                               |     |            |          |         | 1 P.V   | Badly Contaminated. |
| Passaic Ave 259               | 289 | " 14'      | "        | ..      | 1 P. V. | Passable.           |
| Plank Road 701                | 353 | " "        | "        |         | 1 P. V  | "                   |
| " 693                         | 354 | " "        | "        |         | 1 "     | Very Suspicious.    |
| Prince St 242 244             | 425 | " 20'      | "        |         | 1 "     | Passable.           |
| Riverside Ave 3               | 153 | Bucket 7'  | "        | 1 P V.  |         | "                   |
| " 1                           | 154 | " 21'      | "        |         | 1 C P.  | 1 P. V. Suspicious. |
| Riverside, near Verona Avenue | 375 | "          | "        |         | 1 "     | Passable.           |



# WELLS RECORDED.—CONTINUED

## PRIVY VAULT AND CESS- POOLS WITHIN

| LOCATION OF WELL.             | SAMPLE NO. | KIND AND DEPTH. | FOR MANUFACT'G OR DOM. PURPOSES. | 30 FEET | 50 FEET | 100 FEET           | RESULT OF ANALYSIS. |
|-------------------------------|------------|-----------------|----------------------------------|---------|---------|--------------------|---------------------|
| Riverside, near Graton Avenue | 423        | Bucket 40'      | Domestic                         |         |         | 2 C. P.<br>2 P. V. | Passable            |
| River St 63                   | 433        | Pump            | "                                | 1 P. V. |         |                    | "                   |
| " 73                          | 434        | "               | "                                | "       | 1 P. V. |                    | Suspicious          |
| River St 55 57                | 435        | Driven 165'     | "                                | 1 P. V. |         |                    | Contaminated        |
| " 87                          | 235        | Pump            | "                                | 1 "     |         |                    | Suspicious.         |
| Richmond St 11 13             | 295        | bucket 30'      | "                                | 1 C. P. | 1 P. V. |                    | Passable.           |
| Ridge St 6                    | 420        | " 100'          | "                                | 1 P. V. |         |                    | "                   |
| Ridge St 17 19                | 422        | " 70'           | "                                | 1 C. P. | 1 P. V. | 1 P. V.            | Very Suspicious.    |
| Sussex Ave 40                 | 288        | Pump 25'        | "                                | "       | 1 "     |                    | Badly Contaminated  |
| " 70                          | 11         | " 20'           | "                                |         |         | 1 C. P.<br>1 P. V. | " "                 |
| Summer Ave 836                | 12         | Bucket 45'      | "                                |         |         | 1 P. V.            | Passable.           |
| " 123                         | 52         | " 50'           | "                                |         |         | 1 "                | Contaminated.       |
| Summer Ave 115 117            | 53         | " 35'           | "                                | 1 C. P. | 1 P. V. |                    | Suspicious          |
| " 159 161                     | 67         | "               | "                                | 1 P. V. | 2 "     |                    | Contaminated.       |
| " 7                           | 80         | Pump            | "                                |         |         |                    | "                   |
| " 114                         | 148        | Bucket 70'      | "                                |         | 2 P. V. |                    | "                   |
| " 118-120                     | 150        | " 40'           | "                                |         |         | 2 P. V.            | "                   |
| " 138                         | 161        | Artesian 720'   | "                                |         | 1 P. V. |                    | Suspicious.         |
| Seventh Ave 156               | 26         | Pump 70'        | "                                |         |         |                    | Very Suspicious.    |

|                         |     |               |
|-------------------------|-----|---------------|
| Seventh Ave 172 ..      | 33  | .. .. .       |
| " 162. ..               | 65  | Bucket 40'    |
| " 32 34 ..              | 66  | " 10'         |
| " 155 ..                | 77  | " 40'         |
| " 140 ..                | 100 | " 42'         |
| Shipman St 96.          | 36  | Artesian 127' |
| " 34 ..                 | 364 | Pump          |
| South 10th St 494....   | 45  | " 30'         |
| " 521 ..                | 160 | Bucket 40'    |
| " 402.....              | 305 | " 25'         |
| " 489... ..             | 391 | " 55'         |
| Sixth Ave 120. . . . .  | 71  | " 35'         |
| Sixth Ave 128-130.      | 131 | " 30'         |
| Stone St 42.            | 75  | " 30'         |
| " 13 .....              | 103 | Pump —        |
| Stone St 17 19 ..       | 104 | Bucket —      |
| " 16 18 ..              | 105 | " —           |
| " 20 ..                 | 106 | " —           |
| " 32 .....              | 132 | " 19'         |
| South Orange Ave 390 .. | 107 | Pump 50'      |
| " " 425. 329 330        | 330 | Dr. ven 200'  |
| Springfield Ave 398     | 120 | Pump 39'      |
| " 592 ..                | 381 | Bucket 30'    |
| Strafford Place 104 ..  | 170 | " —           |
| Sherman Ave 133 135..   | 191 | " 30'         |
| " 131..                 | 370 | " —           |
| School St 17 19.....    | 200 | " 40'         |
| Sixteenth Ave 171.. ..  | 203 | " 50'         |
| " 174.....              | 390 | " 36'         |
| South 11th St —...      | 222 | " 26'         |

# Domestic.

|       |         |         |                     |
|-------|---------|---------|---------------------|
| .. .. | 1 P. V. | 3 P. V. | Low Water.          |
| "     | 1 C. P. | 2 "     | Contaminated.       |
| "     | 1 "     | 1 "     | "                   |
| "     | 2 "     | .. ..   | Suspicious.         |
| "     | .. ..   | .. ..   | Passable.           |
| "     | 1 P. V. | 3 "     | Badly Contaminated. |
| "     | 1 "     | 1 "     | " "                 |
| "     | 1 "     | .. ..   | Contaminated.       |
| "     | 1 "     | .. ..   | Badly Contaminated. |
| "     | 1 C. P. | .. ..   | " "                 |
| "     | 1 P. V. | .. ..   | Contaminated.       |
| "     | 5 "     | 1 "     | Passable.           |
| "     | 2 "     | .. ..   | "                   |
| "     | 5 "     | 1 C. P. | Contaminated.       |
| "     | .. ..   | 2 "     | "                   |
| "     | .. ..   | 2 "     | Badly Contaminated. |
| "     | .. ..   | 1 "     | Contaminated.       |
| "     | .. ..   | 1 P. V. | Suspicious.         |
| "     | .. ..   | .. ..   | .. ..               |
| "     | .. ..   | 1 "     | Suspicious.         |
| "     | 1 "     | 1 "     | Badly Contaminated. |
| "     | 2 "     | .. ..   | Very Suspicious.    |
| "     | 1 "     | .. ..   | Passable.           |
| "     | .. ..   | 1 C. P. | Suspicious.         |
| "     | .. ..   | 2 P. V. | Contaminated.       |
| "     | 1 "     | .. ..   | "                   |
| "     | 1 "     | .. ..   | "                   |
| "     | .. ..   | 1 "     | "                   |

# WELLS RECORDED.—CONTINUED

## PRIVY VAULT AND CESS- POOLS WITHIN

| LOCATION OF WELL      | SAMPLE<br>NO. | KIND AND<br>DEPTH | FOR MANUFACT'G.<br>OR<br>DOM. PURPOSES | PRIVY VAULT AND CESS-<br>POOLS WITHIN |         |         | RESULT OF ANALYSIS. |
|-----------------------|---------------|-------------------|--|---------------------------------------|---------|---------|---------------------|
|                       |               |                   |  | 30 FEET                               | 50 FEET | 100 FT  |                     |
| South 11th St 595 507 | 223           | Pump 30'          | Domestic                               |                                       | 1 P. V. | 1 C. P. | Very Suspicious     |
| " " 491               | 355           | " 32'             | "                                      | 1 P. V.                               |         |         | Contaminated        |
| South 7th St 433 435  | 418           | " 25'             | "                                      |                                       | 1 "     |         | Suspicious          |
| South 12th St 628     | 419           | " 35'             | "                                      | 1 "                                   | 1 "     |         | "                   |
| South 13th St 15      | 231           | " 23'             | "                                      |                                       | 1 "     |         | Very Suspicious.    |
| South 14th St 22      | 411           | Driven 70'        | "                                      | 1 "                                   |         |         | Passable            |
| South St 156.         | 241           | Pump 20'          | "                                      |                                       |         | 1 P. V. | Very Badly Contam.  |
| " 129                 | 259           | " "               | "                                      |                                       |         | 1 "     | Contaminated        |
| St. Charles St 85 87  | 246           | " 15'             | "                                      | 1 "                                   | 1 "     |         | Very Badly Contam   |
| Somerset St 85.       | 200           | " 30'             | "                                      |                                       | 1 "     |         | " " "               |
| Summit St 119         | 315           | Bucket 30'        | "                                      | 1 "                                   |         |         | Contaminated.       |
| " 55 57               | 401           | " 30'             |  | { 2 C. P.,<br>2 P. V.                 |         |         | Very Suspicious.    |
| State St 33 35        | 302           | " 30'             | "                                      |                                       | 1 "     |         | [Contaminated.      |
| Sheffield St 93       | 303           | " 40'             | "                                      | 1 "                                   | 1 "     |         | "                   |
| " 136                 | 304           | " 30'             | "                                      |                                       |         |         | "                   |
| Sussex Ave 40         | 285           | Pump 25'          | "                                      |                                       | 1 "     |         | Badly Contaminated. |
| Stratford Place 9     | 213           | " "               | "                                      |                                       | 1 "     |         | Suspicious          |
| Spruce St 159         | 459           | " "               | "                                      | 1 "                                   |         |         | Badly Contaminated. |
| Spruce St 161 163     | 460           | " "               | "                                      |                                       | 1 "     |         | "                   |
| Seabury St 42         | 461           | " 50'             | "                                      | 1 C. P.                               |         | 2 "     | Passable.           |
| " 50.                 | 462           | " 50'             | "                                      |                                       | 1 C. P. | 1 "     | "                   |
| Taylor St 38          | 68            | Bucket 30'        | "                                      |                                       | 1 P. V. |         | Badly Contaminated. |

|                           |     |             |          |       |         |                     |
|---------------------------|-----|-------------|----------|-------|---------|---------------------|
| Rayor St 69 .             | 111 | Pump        | Domestic |       | 2 P. V  | Badly Contaminated. |
| Thomas St 98              | 225 | " 35'       | "        | 1 C P | 1 "     | Very Suspicious.    |
| Third St 59 .             | 313 | Driven 112' | "        |       | 2 P V   | Passable            |
| " 617 . . . .             | 297 | Pump 71'    | "        |       | 0 "     |                     |
| Union St 84 . . .         | 186 | Bucket 25'  | "        | 1 "   | 2 "     | Badly Contaminated  |
| " 82 . . . . .            | 269 | " 40'       | "        | 1 "   | 1 "     | " "                 |
| " 92 . . . . .            | 210 | " 45'       | "        | 1 "   | 1 "     | " "                 |
| " 93 . . . . .            | 292 | Pump 40'    | "        |       | 1 "     | Passable.           |
| " 89 . . . . .            | 293 | Bucket 30'  | "        |       | 1 "     | " "                 |
| " 97 . . . . .            | 211 | " 50'       | "        | 1 "   |         | Very Suspicious.    |
| Vesey St 29 . . .         | 144 | Pump        | "        |       | 1 "     | Badly Contaminated. |
| Van Buren St 284          | 176 | "           | "        | 1 P V |         | " "                 |
| " " 288 . . . .           | 398 | " 16'       | "        | 2 "   |         | " "                 |
| " " 292 . . . .           | 399 | " 18'       | "        | 1 "   |         | " "                 |
| Wallace St 94 96. . .     | 20  | " 50'       | "        |       |         | " "                 |
| Warren St 330-330½        | 44  | Bucket 45'  | "        |       | 4 P V   | " "                 |
| " 271 . . . . .           | 156 | " 40'       | "        | 2 "   |         |                     |
| " 217 . . . . .           | 355 | " 25'       | "        | 1 "   |         | Badly Contaminated. |
| " 335 . . . . .           | 361 | " 30'       | "        | 1 "   |         | Very Suspicious.    |
| " 71 73 . . . . .         | 371 | " 18'       | "        | 2 "   |         | Badly Contaminated. |
| " 75 77 . . . . .         | 377 | " 20'       | "        |       | 1 "     | Contaminated        |
| " 502 . . . . .           | 432 | " 50'       | "        |       | 1 "     | Suspicious.         |
| Washington St 441         | 72  | " 30'       | "        |       | 1 "     | " "                 |
| " 319 . . . . .           | 95  | " 40'       | "        |       | 1 "     | Contaminated.       |
| " 483 485 . . . .         | 263 | Pump        | "        |       | 1 "     | Very Suspicious.    |
| " 410 412 . . . .         | 376 | " 35'       | "        |       | 2 "     | " "                 |
| " 424 . . . . .           | 373 | Bucket 20'  | "        |       | 1 "     | Passable.           |
| " 451 . . . . .           | 393 | " 25'       | "        | 4 "   | 1 C P.  | Contaminated.       |
| Washington Ave 202        | 78  | " 50'       | "        |       | 2 "     | Passable            |
| " 196 198 . . . .         | 76  | " 50'       | "        | ...   | 1 "     | " "                 |
| " 173 175 . . . .         | 79  | " 75'       | "        |       | 2 C P   | No Fault.           |
| " 173 175 . . . .         | 79  | " 75'       | "        |       | 2 P. V. | No Fault.           |
| West St 105-107 . . . . . | 140 | Pump 35'    | "        | 1 "   |         | Suspicious.         |

# WELLS RECORDED.—CONTINUED

| LOCATION OF WELL             | SAMPLE NO. | KIND AND DEPTH | FOR MANUFACT'G OR DOM. PURPOSES. | PRIVY VAULT AND CESS POOL WITHIN |                    |                    | RESULTS OF ANALYSIS |
|------------------------------|------------|----------------|----------------------------------|----------------------------------|--------------------|--------------------|---------------------|
|                              |            |                |                                  | 30 FEET                          | 50 FEET            | 100 FEET           |                     |
| West St 67-69 . . . . .      | 196        | Pump 30'       | Domestic                         | 1 P. V.                          |                    |                    | Contaminated.       |
| " 126 . . . . .              | 430        | Bucket 35'     | "                                | .....                            | 1 P. V.            | .....              | "                   |
| Walnut St 100 . . . . .      | 173        | " 35'          | "                                | 2 "                              | .....              | .....              | "                   |
| " 138 . . . . .              | 273        | Pump —         | "                                | .....                            | 1 C. P.<br>1 P. V. | .....              | "                   |
| " 185 . . . . .              | 312        | " —            | "                                | .....                            | 1 "                | .....              | .....               |
| Westcott St 72 . . . . .     | 217        | " 13'          | "                                | 1 "                              | .....              | .....              | Passable.           |
| West Kinney St 183 . . . . . | 227        | " 25'          | "                                | .....                            | .....              | 1 C. P.<br>1 P. V. | "                   |
| " " 93 . . . . .             | 264        | Bucket 25'     | "                                | .....                            | 1 "                | .....              | Suspicious.         |
| Waverly Ave 348 . . . . .    | 274        | Pump 30'       | "                                | .....                            | .....              | 1 P. V.            | "                   |
| Wilsey St 73 . . . . .       | 453        | " 35'          | "                                | .....                            | 1 "                | .....              | Very Suspicious.    |
| " 79 . . . . .               | 442        | Bucket 35'     | "                                | .....                            | 1 "                | .....              | Contaminated.       |
| Webster St 78 . . . . .      | 337        | " 35'          | "                                | .....                            | 1 "                | .....              | Suspicious          |

---

**ANALYSES OF WELLS.**

---

## ANALYSES OF WELL WATER.

[PARTS PER 100,000.]

| SAMPLE NO. | FREE    |          | ALBUMENOID | CHLORINE           | NITROGEN |          | REMARKS       |
|------------|---------|----------|------------|--------------------|----------|----------|---------------|
|            | AMMONIA | AMMONIA. |            |                    | AS       |          |               |
|            |         |          |            |                    | NITRATES | NITRATES |               |
| 1          | 016     | 018      | 6 10       | Very excessive     |          |          | Typhoid Fever |
| 2          | 00266   | 005      | 3 10       | Trace              |          |          |               |
| 3          | 0206    | 008      | 5          | Excessive          |          |          |               |
| 4          | 00106   | 0026     | 3 70       | Trace              |          |          |               |
| 5          | 03733   | 0105     | 3 10       | Very excessive     |          |          |               |
| 6          | 030     | 0205     | 4 25       | "                  |          |          |               |
| 7          | 00133   | 010      | 7 90       | Small              |          | 5 6      |               |
| 8          | 03332   | 0325     | 5 70       | Very excessive     |          |          |               |
| 9          | 00333   | 012      | 7 80       | "                  |          | 4 0      |               |
| 10         | 00133   | 009      | 1 70       | Small              |          | 1 5      |               |
| 11         | 016     | 008      | 1 60       | Excessive          |          | 1 0      |               |
| 12         | 00133   | 005      | 2 30       | Slightly excessive |          | 1 2      |               |
| 13         | 00055   | 032      | 3 20       | Very excessive     |          | 1 3      |               |
| 14         | 00133   | 005      | 5 10       | Slightly excessive |          | 3 6      |               |
| 15         | 0008    | 004      | 3 30       | Trace              |          | 1 1      |               |
| 16         | 00533   | 0075     | 3 50       | Small              |          | 7 3      |               |
| 17         | 040     | 025      | 3 60       | Excessive          |          |          |               |
| 18         | 004     | 008      | 2 70       | "                  |          | 1 2      |               |
| 19         | 090     | 028      | 8 90       | Small              |          | 6 6      | Typhoid Fever |
| 20         | 002     | 009      | 7 80       | Excessive          |          | 6 0      |               |
| 21         | 00266   | 002      | 6 8        | Slightly excessive |          | 5 4      |               |
| 22         | Trace   | 000      | 1 8        | Very excessive     |          |          |               |
| 23         | 00133   | 002      | 13 40      | "                  |          |          |               |
| 24         | 008     | 017      | 4 00       | "                  |          |          |               |
| 25         | 655     | 029      | 14 10      | "                  |          | 4 0      |               |
| 26         | 00266   | 0054     | 3 00       | Small              |          | 2 0      | Typhoid Fever |
| 27         | 004     | 009      | 2 40       | Excessive          |          | 1 5      |               |
| 28         | 00133   | 005      | 2 70       | Trace              |          |          |               |
| 29         | 552     | 010      | 1 80       | Very excessive     |          | 2 2      |               |
| 30         | 00133   | 005      | 5 50       | Trace              |          | 1 7      | Typhoid Fever |
| 31         | 0048    | 015      | 6 00       | Slightly excessive |          | 1 5      |               |
| 32         | 01533   | 0105     | 7 10       | Very excessive     |          |          |               |
| 33         | 01333   | 0135     | 4 60       | Excessive          |          |          |               |
| 34         | 00532   | 025      | 5 60       | Very excessive     |          |          |               |
| 35         | Trace   | 0045     | 1 40       | Small              |          | 6        | Typhoid Fever |
| 36         | 0009    | 012      | 10 50      | Very excessive.    |          | 3 7      |               |
| 37         | 002     | 005      | 60         | Trace              |          | 2        | Typhoid Fever |
| 38         | 00133   | 011      | 4 40       | Slightly excessive |          | 1 5      |               |
| 39         | 002     | 012      | 3 30       | Small              |          | 1 0      |               |
| 40         | 13333   | 01       | 11 70      | Very excessive     |          | 2 0      |               |
| 41         | 14      | 0185     | 14 00      | Excessive          |          | 2 5      |               |
| 42         | 002     | 002      | 3 10       | Excessive          |          | 1 2      |               |
| 43         | 002     | 0045     | 3 60       | "                  |          | 2 5      |               |
| 44         | 00133   | 0045     | 3 70       | Trace              |          |          |               |
| 45         | 00533   | 058      | 23 70      | Very excessive     |          |          |               |
| 46         | Trace   | 00       | 4 50       | Excessive          |          |          |               |
| 47         | 004     | 007      | 5 4        | "                  |          |          |               |
| 48         | 0045    | 051      | 15 50      | Very excessive     |          |          |               |
| 49         | 002     | 0075     | Trace      | Small              |          | 0 6      | Cistern       |
| 50         | 0008    | 016      | 1 00       | Excessive          |          |          |               |
| 51         | 002     | 007      | 3 00       | Small              |          | 5 5      |               |
| 52         | 008     | 0097     | 6 00       | Very excessive     |          | 3 5      |               |
| 53         | 2 +     | 055      | 24 40      | "                  |          | 9 14     | Typhoid Fever |
| 54         | 2065    | 024      | 8 00       | "                  |          | 6 80     |               |
| 55         | 00266   | 0205     | 1 7        | "                  |          | 1 60     |               |
| 56         | 44      | 018      | 18 0       | "                  |          | 5 7      |               |
| 57         | 004     | 015      | 16 0       | "                  |          | 9 20     |               |
| 58         | 004     | 019      | 9 4        | Excessive          |          | 7 4      |               |
| 59         | 005     | 044      | 6 2        | Very excessive     |          |          |               |
| 60         | 00266   | 0107     | 15 6       | Excessive          |          | 3 00     |               |
| 61         | 0024    | 0297     | 5 6        | Small              |          | 4 40     | Typhoid Fever |
| 62         | 0005    | 004      | 6 2        | "                  |          | 2 50     |               |
| 63         | 004     | 028      | 5 3        | Excessive          |          | 3 30     |               |
| 64         | 00133   | 0104     | 6 0        | Small              |          | 5 50     |               |
| 65         | 048     | 0121     | 7 2        | Very excessive     |          | 4 40     |               |
| 66         | 00465   | 014      | 8 4        | Excessive          |          | 10 80    | Typhoid Fever |
| 67         | 00133   | 011      | 7 0        | "                  |          | 4 0      |               |
| 68         | 00133   | 009      | 2 3        | Small              |          | 2 00     |               |
| 69         | 466 +   | 0205     | 11 2       | Very excessive     |          | 3 0      |               |

\*Reanalyzed

† Not Determined

## ANALYSES OF WELL WATER. CONTINUED.

[PARTS PER 100,000]

| SAMPLE NO. | FREE   |         | AMMONIAC | AMMONIA            | NITROGEN | NITROGEN |               | REMARKS |
|------------|--------|---------|----------|--------------------|----------|----------|---------------|---------|
|            | AMM. N | AMMONIA | AS       |                    |          | AS       |               |         |
|            |        |         | NITRATES |                    |          | NITRATES |               |         |
| 61         | 33     | 135     | 11.3     | Very excessive     | 1.6      |          |               |         |
| 62         | 21     | 0.5     | 4.9      | "                  | 4.7      |          |               |         |
| 63         | 333+   | 0.85    | 1.1      | "                  | 2.3      |          |               |         |
| 64         | 3033   | 0.085   | 8.0      | Slightly excessive | 4.1      |          |               |         |
| 64*        | 0.333  | 0.06    | 8.3      | Very excessive     | 2.6      |          |               |         |
| 65         | 805    | 118     | 16.3     | Excessive          | 1.20     |          | Typhoid Fever |         |
| 66         | 805    | 118     | 6.5      | Very excessive     | 7.0      |          |               |         |
| 67         | 8026   | 0.06    | 5        | Slightly excessive | 7.00     |          |               |         |
| 67*        | 3330   | 0.09    | 7        | "                  | 1.50     |          |               |         |
| 68         | 6+     | 0.15    | 5.4      | Very excessive     | 4.6      |          |               |         |
| 69         | 32     | 07      | 13.5     | "                  | 12.06    |          |               |         |
| 71         | 0.12   | 0.095   | 5.1      | Excessive          | 1.3      |          |               |         |
| 71         | 08     | 042     | 20.1     | Very excessive     | 3.3      |          | Typhoid Fever |         |
| 72         | 80.45  | 00.5    | 4.2      | Small              | 7.0      |          |               |         |
| 73         | 8066   | 11.5    | 8.6      | Very excessive     | 7.6      |          |               |         |
| 74         | 8      |         | 2.5      | "                  | 3.7      |          | Typhoid Fever |         |
| 75         | 004    | 0.07    | 3.2      | Excessive          | 2.2      |          |               |         |
| 76         | 304    | 0.083   | 2.7      | "                  | 1.1      |          |               |         |
| 76*        | 0.072  | 0.6     | 3.3      | Trace              | 7        |          |               |         |
| 77         | 0.44   | 0.05    | 6.8      | Slightly excessive | 4.5      |          | Typhoid Fever |         |
| 78         | 004    | 05      | 2.3      | Excessive          | 5        |          |               |         |
| 78*        | 30.08  | 003     | 2.6      | Trace              | 1.3      |          |               |         |
| 79         | 0.08   | 0.026   | 1.3      | Small              | 4        |          |               |         |
| 80         | 0.33   | 0.046   | 5.4      | "                  | 1.5      |          |               |         |
| 81         | 0.45   | 0.044   | 2.0      | Trace              | 8        |          |               |         |
| 82         | 304    | 11.     | 5.4      | Excessive          | 6        |          |               |         |
| 83         | 80     | 0.08    | 7.5      | "                  | 3.0      |          |               |         |
| 84         | 30.04  | 0.02    | 7.7      | Small              | 2.7      |          |               |         |
| 85         | 3.50   | 0.003   | 2.6      | Slightly excessive | 1.5      |          |               |         |
| 85*        | 0.04   | 1.      | 0.9      | "                  | 2.1      |          |               |         |
| 86         | 0.0566 | 0.0     | 2.7      | Excessive          | 1.5      |          | Typhoid Fever |         |
| 87         | 0.133  | 0.055   | 2.4      | Trace              | 7        |          |               |         |
| 87*        | 0.0133 | 0.      | 1.2      | Slightly excessive | 1.5      |          |               |         |
| 88         | 0.028  | 1.4     | 2.6      | Small              | 1.3      |          |               |         |
| 88*        | 0.6    | 11.5    | 9        | "                  | 5        |          |               |         |
| 89         | 1.4    | 11.8    | 7.7      | Very excessive     | 4.2      |          |               |         |
| 91         | 6+     | 0.34    | 2.0      | Excessive          | 10.5     |          |               |         |
| 92         | 0.04   | 0.13    | 8        | "                  | 2        |          |               |         |
| 93         | 0.33   | 0.17    | 7.1      | Small              | 5.8      |          |               |         |
| 94         | Trace  | 0.065   | 4.2      | Excessive          | 1.0      |          |               |         |
| 95         | 0.072  | 0.14    | 5.5      | "                  | 5.0      |          |               |         |
| 96         | 0.0532 | 05      | 3.8      | Very excessive     | 2.0      |          |               |         |
| 98         | 0.02   | 0.085   | 4.6      | Small              | 2.0      |          |               |         |
| 99         | 0.04   | 0.09    | 6.0      | Excessive          | 2.3      |          |               |         |
| 100        | 0.08   | 0.2     | 2.0      | Small              | 6.0      |          | Typhoid Fever |         |
| 100*       | Trace  | 0.05    | 1.7      | "                  | 1.2      |          |               |         |
| 101        | 0.04   | 0.06    | 10.0     | Slightly excessive | 3.6      |          |               |         |
| 102        | 0.33   | 0.45    | 8        | Very excessive     | 5.1      |          |               |         |
| 103        | 0.1    | 0.05    | 3.8      | Trace              | 8        |          |               |         |
| 104        | 0.25+  | +       | 5.7      | Very excessive     | 4.6      |          |               |         |
| 105        | 0.02   | 11.4    | 7.2      | Slightly excessive | 2.0      |          |               |         |
| 106        | 0.2+   | 0.02    | 1.3      | Very excessive     | 1.6      |          |               |         |
| 107        | Trace  | 0       | 4.8      | Small              | 1.5      |          |               |         |
| 107*       |        | 0.1     | 4.3      | "                  | 3.6      |          |               |         |
| 108        | 0.08   | 0.063   | 1.6      | Excessive          | 1.2      |          |               |         |
| 110        | 0.33   | 0.085   | 7.2      | Slightly excessive | 0.5      |          |               |         |
| 111        | 0.53+  | 0.05    | 2.0      | Very excessive     | 5.5      |          |               |         |
| 112        | 0.053. | 0.1     | 6.3      | "                  | 4.25     |          |               |         |
| 113        | +      |         | 12.7     | "                  | 3.5      |          |               |         |
| 114        | 0.02   | 0.2     | 5.1      | Small              | 2.25     |          |               |         |
| 115        | 0.04   | 0.07    | 4.5      | Excessive          | 4.5      |          | Typhoid Fever |         |
| 117        | 0.40   | 0.2+    | 3.5      | Slightly excessive | 5.0      |          | " "           |         |
| 118        | 0.04   | 0.022   | 8.6      | Excessive          | 2.0      |          | " "           |         |
| 119        | 0.04   | 0.06    | 6        | Very excessive     | 4.0      |          |               |         |
| 120        | 0.33   | 0.05    | 4.2      | Excessive          | 3.3      |          |               |         |
| 120*       | 0.005  | 0.      | 5.3      | Small              | 7.5      |          |               |         |
| 121        | 1.6    | 0.1     | 7.5      | Very excessive     | 1.2      |          | Typhoid Fever |         |
| 122        | 2+     | +       | 15.4     | "                  | 7        |          |               |         |
| 123        | 0.6+   | 0.03    | 2.0      | "                  | 7        |          |               |         |

\* Reanalyzed.

† Not Determined.



# ANALYSES OF WELL WATER. CONTINUED

[PARTS PER 100,000.]

| SAMPLE NO. | FREE ALBUMENOID |         | CHLORIDE. | NITROGEN           |             | REMARKS.      |
|------------|-----------------|---------|-----------|--------------------|-------------|---------------|
|            | AMMONIA         | AMMONIA |           | AS NITRATES        | AS NITRATES |               |
| 24         | 0008            | 0065    | 2.5       | Slightly excessive | 1.0         | Typhoid Fever |
| 25         | 002             | 0106    | 5.2       | Small              | 3.5         | " "           |
| 26         | 0036            | 009     | 9.0       | Excessive          | 5.0         | " "           |
| 27         | 004             | 009     | 7.6       | Slightly excessive | 4.0         | " "           |
| 28         | 004             | 008     | 2.0       | "                  | "           | " "           |
| 29         | 006             | 008     | 3.0       | Excessive          | "           | " "           |
| 30         | 1333            | 0215    | 12.2      | "                  | 4.8         | Typhoid Fever |
| 31         | 08              | 019     | 4.6       | Very excessive     | 5.0         | " "           |
| 32         | 002             | 01      | 9.0       | Excessive          | 5.0         | " "           |
| 33         | 012             | 017     | 7.4       | Very excessive     | 6.8         | Typhoid Fever |
| 34         | 0045            | 0085    | 9.5       | "                  | 5.0         | " "           |
| 35         | 0033            | 0045    | 4.7       | Slightly excessive | 1.8         | " "           |
| 36         | 0065            | 0116    | 3.2       | Excessive          | 2.5         | " "           |
| 37         | 040             | 018     | 4.8       | Very excessive     | 3.0         | " "           |
| 38         | 2.66+           | +       | 19.0      | Excessive          | 1.2         | " "           |
| 39         | 063+            | 0106    | 7.1       | Very excessive     | 4.8         | " "           |
| 40         | 1.25+           | +       | 32.0      | "                  | 9.5         | " "           |
| 41         | Trace           | 0075    | 6.2       | Small              | 7.0         | Typhoid Fever |
| 42         | 0032            | 009     | 8.2       | Very excessive     | 4.0         | " "           |
| 43         | 002             | 0065    | 1.8       | Small              | 1.5         | " "           |
| 44         | 080             | 016     | 6.8       | Very excessive     | "           | " "           |
| 45         | 2+              | 12      | 5.1       | Excessive          | 2           | " "           |
| 46         | 800+            | +       | 11.0      | Very excessive     | 14.0        | " "           |
| 47         | 1.25+           | +       | 26.0      | Small              | 10.00       | " "           |
| 48         | 0039+           | 0105    | 3.4       | Very excessive     | 1.60        | Typhoid Fever |
| 49         | 016             | 020     | 12.0      | Excessive          | 6.50        | " "           |
| 50         | 0033            | 0115    | 4.4       | Very excessive.    | 2.0         | " "           |
| 51         | 75+             | +       | 12.8      | "                  | 7.00        | " "           |
| 52         | 012             | 013     | 8.8       | "                  | 1.0         | " "           |
| 53         | 9.4             | 0045    | 6         | Small              | 1.0         | " "           |
| 54         | 002             | 004     | 1         | Excessive          | 0           | " "           |
| 55         | 00266           | 010     | 8.5       | Slightly excessive | 10.00       | " "           |
| 56         | 230+            | 0115    | 6.5       | Excessive.         | 4.00        | Typhoid Fever |
| 57         | 053+            | 0105    | 5.2       | "                  | 3.00        | " "           |
| 58         | Trace           | 0065    | 3.5       | Trace              | 1.00        | " "           |
| 59         | 004             | 010     | 7         | "                  | 1.00        | " "           |
| 60         | 15+             | +       | 30.0      | Slightly excessive | 1.30        | " "           |
| 61         | 0008            | 0130    | 5         | Excessive          | 11.50       | " "           |
| 62         | 0033            | 0145    | 5.0       | Very excessive     | 5.00        | " "           |
| 63         | 004             | 0075    | 6.6       | Excessive          | 2.6         | " "           |
| 64         | 0045            | 0115    | 6.1       | Slightly excessive | 2.9         | " "           |
| 65         | 004             | 006     | 11.0      | Very excessive     | 4.5         | " "           |
| 66         | 014             | 19      | 7.8       | Excessive          | 5.1         | " "           |
| 67         | 0032            | 020     | 13.8      | Slightly excessive | 5.1         | " "           |
| 68         | 2.8+            | +       | 16.5      | Very excessive     | 12.0        | " "           |
| 69         | 00266           | 006     | 2.1       | "                  | 1.65        | " "           |
| 70         | 0033            | 0145    | 3.8       | Excessive          | 3.5         | Typhoid Fever |
| 71         | 0012            | 0125    | 1.8       | "                  | 5           | " "           |
| 72         | 1333            | +       | 3.4       | Small              | 5           | " "           |
| 73         | 440             | 009     | 18.5      | Very excessive.    | 5.5         | " "           |
| 74         | Trace           | 0025    | 17.0      | "                  | 3.5         | " "           |
| 75         | 001             | 006     | 17.0      | Small              | 5.1         | " "           |
| 76         | 260             | 014     | 9.2       | Very excessive     | 2.0         | " "           |
| 77         | 003             | 009     | 10.6      | "                  | 5.1         | " "           |
| 78         | Trace           | 0155    | 7.3       | Excessive          | 4.1         | " "           |
| 79         | 10              | 019     | 11.8      | Slightly excessive | 4.5         | Typhoid Fever |
| 80         | 00133           | 0075    | 4.9       | Small              | 8.5         | " "           |
| 81         | 051             | 022     | 4.9       | Excessive          | 3.2         | " "           |
| 82         | 0045            | 015     | 2.2       | "                  | 2           | " "           |
| 83         | 016             | 0105    | 2.2       | "                  | 2.0         | " "           |
| 84         | 2+              | +       | 20.0      | "                  | 2.8         | " "           |
| 85         | 00              | 025     | 4.5       | Very excessive     | 10.0        | " "           |
| 86         | 003+            | 0105    | 5.6       | Excessive          | 3.2         | " "           |
| 87         | 1               | +       | 4.5       | Very excessive     | 3           | " "           |
| 88         | 032             | 0075    | 5.1       | Excessive          | 3           | " "           |
| 89         | Trace           | 016     | 1.4       | Very excessive     | 2.5         | " "           |
| 90         | 004             | 0115    | 4.2       | Excessive          | 6           | Typhoid Fever |
| 91         |                 |         |           | Slightly excessive | 1.5         | " "           |

\* Reanalyzed.

† Not Determined

## ANALYSES OF WELL WATER.—CONTINUED

[PARTS PER 100,000.]

| SAMPLE NO. | FREE ALBUMENOID |         | CHLORINE | NITROGEN           |          | REMARKS.      |
|------------|-----------------|---------|----------|--------------------|----------|---------------|
|            | AMMONIA.        | AMMONIA |          | AS                 | AS       |               |
|            |                 |         |          | NITRITES.          | NITRATES |               |
| 193        | 012             | 0145    | 7.0      | Slightly excessive | 6        |               |
| 195        | Trace           | 007     | 1.0      | Small              | 5        | Typhoid Fever |
| 196        | 00153           | 0106    | 11.6     | Very excessive     | 5.8      |               |
| 197        | 0004            | 0.4     | 5        | Small              | 35       |               |
| 198        | 75+             | +       | 3.4      | Very excessive     | 30       |               |
| 199        | 002             | 007     | 3.4      | Excessive          | 1.30     |               |
| 200        | 002             | 0.      | 3.1      | Slight } excessive | 2.3      | Typhoid Fever |
| 201        | 01065           | 009     | 10.7     | Excessive          | 6.5      |               |
| 202        | Trace           | 0125    | 4.4      | Small              | 3.2      |               |
| 203        | 02133           | 012     | 4.4      |                    | 2.4      |               |
| 204        | 00333           | +       | 3.1      | Very excessive     | 6.3      |               |
| 205        | 004             | 008     | 4.5      | Small              | 2.4      |               |
| 206        | 004             | 012     | 3.3      | Excessive          | 2.7      |               |
| 207        | 004             | 008     | 4.6      |                    | 4.5      | Typhoid Fever |
| 208        | 0064            | 022     | 4.1      | "                  | 1.8      |               |
| 209        | Trace           | 007     | 5.5      | Slightly excessive | 1.8      |               |
| 210        | 15+             | +       | 10.2     | "                  | 5.8      | " "           |
| 211        | 00533           | 011     | 2.3      | Excessive          | 1.5      |               |
| 211*       | 004             | 007     | 7.1      |                    | 4.0      |               |
| 212        | 004             | 011     | 6.5      | "                  | 2.9      |               |
| 213        | 00333           | 007     | 1.8      | Very excessive     |          |               |
| 214        | 3+              | +       | 7.0      | "                  | 2.8      |               |
| 215        | 056             | 020     | 6.5      | "                  | 1.5      |               |
| 216        | 5+              | +       | 13.6     | "                  | 5.0      |               |
| 217        | 00266           | 005     | 2.1      | Small              | 9        |               |
| 218        | +               | 035     | 1        | Very excessive     | 5.0      |               |
| 219        | 00266           | 0175    | 8.0      | Slightly excessive | 2.9      |               |
| 220        | 004             | 0105    | 4.0      | Small              | 1.5      |               |
| 221        | 005+            | 004+    | 5.0      | Very excessive     | 2.3      |               |
| 222        | 0256            | 019     | 1        |                    | 6        |               |
| 223        | 002             | 007     | 9.1      | Slightly excessive | 2.0      |               |
| 224        | 0060            | 012     | 2.4      | Excessive          | 2.0      |               |
| 225        | 008             | 007     | 2.4      | Very excessive     | 1.3      |               |
| 226        | 0032            | 008     | 3        | Small              | 1.2      |               |
| 227        | None            | 003     | 2.4      | Excessive          | 1.1      |               |
| 228        | 0056            | 019     | 2.3      |                    | 2.9      |               |
| 229        | 04              | 016     | 9.5      |                    | 2.9      |               |
| 230        | 0032            | 010     | 2.6      | "                  | 1.5      |               |
| 231        | 00066           | 013     | 2.4      | Small              | 1.8      |               |
| 232        | 004             | 013     | 4.2      |                    | 11.0     |               |
| 233        | 010             | 018     | 9.8      |                    | 5.0      |               |
| 234        | 790             | 018     | 4.3      | Very excessive     | 1.3      |               |
| 235        | 005             | 0115    | 1.3      | Excessive          | 5.3      |               |
| 237        | 0015            | 007     | 3.6      | Small              | 2.3      |               |
| 238        | 004             | 0065    | 7.2      | Excessive          | 5.3      |               |
| 239        | 25+             | +       | 15       | Very excessive     | 1.8      |               |
| 240        | 004             | 009     | 6.6      | Excessive          | 5.0      |               |
| 241        | 4+              | +       | 11.3     | Very excessive     | 2.8      |               |
| 242        | 0136            | 012     | 4.4      | "                  | 4.0      |               |
| 243        | 5+              | +       | 2.6      | Excessive          | 1.3      |               |
| 245        | 0033            | 007     | 2.6      | Very excessive     | 2.5      |               |
| 246        | 12+             | 019     | 14.3     | "                  | 1.2      |               |
| 247        | 0800            | 0040    | 4.6      | "                  | 1.4      |               |
| 248        | 002             | 009     | 4.7      | Small              | 2.5      | Typhoid Fever |
| 249        | 002             | 011     | 6.0      | Excessive          | 5.0      |               |
| 249*       | 0015            | 0135    | 4.8      | Small              | 1.5      |               |
| 250        | 004             | 010     | 5.9      | Trace              | 2.1      |               |
| 251        | 04+             | +       | 5.9      | Very excessive     | 4.5      |               |
| 252        | 00133           | 011     | 9.8      | Slightly excessive | 2.2      |               |
| 253        | 002             | 015     | 9.3      | Very excessive     | 2.2      |               |
| 254        | Trace           | 005     | 1.9      | Small              | 7        |               |
| 255        | 006             | 011     | 4.7      | Slightly excessive | 2.2      |               |
| 256        | 00133           | 0075    | 4.5      |                    | 2.0      |               |
| 257        | 14+             | +       | 4.0      | Very excessive     | 2.0      |               |
| 258        | Trace           | 006     | 4.3      | Small              | 2.7      | Typhoid Fever |
| 259        | 005             | 017     | 5.2      | Very excessive     | 2.4      |               |
| 260        | 025+            | +       | 14.0     | Excessive          | 2.7      |               |
| 261        | 10+             | 025     | 10.5     | Slightly excessive | 3.2      |               |
| 263        | 0032            | 010     | 5.0      | "                  |          |               |

\* Reanalyzed.

† Not Determined.

## ANALYSES OF WELL WATER.—CONTINUED

[PARTS PER 100,000.]

| SAMPLE NO. | FREE    |                    | CHLORINE | NITROGEN           |          | REMARKS       |
|------------|---------|--------------------|----------|--------------------|----------|---------------|
|            | AMMONIA | ALBUMINOID AMMONIA |          | AS                 | NITROGEN |               |
|            |         |                    |          | NITRITES           | NITRATES |               |
| 264        | 002     | 05                 | 11       | Trace              |          |               |
| 265        | 008     | 054                | 29       | Very excessive     | 8.8      | Typhoid fever |
| 266        | 0033    | 02                 | 5        | Excessive          | 7        |               |
| 267        | 00.57   | 07                 | 14       | Slightly excessive | 7.2      |               |
| 268        | 03      | 03                 | 11       | Excessive          | 5        |               |
| 269        | +       | 03                 | 23       | Excessive          | 5.1      |               |
| 270*       | Trace   | 1                  | 3        | Slightly excessive | 1        |               |
| 271        | 002     | 16                 | 1        | Slightly excessive | 1        |               |
| 272        | Trace   | +                  | 1        | Slightly excessive | 2        |               |
| 273        | 001     | 015                | 5.0      | Slightly excessive | 2.5      |               |
| 274        | 0015    | 009                | 4.8      | Small              | 2.5      |               |
| 275        | 138+    | 020                | 6.5      | Very excessive     | 2.1      |               |
| 277        | 016     | 028                | 6.7      | Slightly excessive | 5        |               |
| 278        | 565     | 02                 | 6.0      |                    | 8        |               |
| 279        | 17      | +                  | 10.1     | Excessive          | 14       |               |
| 280        | 049     | 021                | 1        | Very excessive     | 1.1      |               |
| 281        | 044     | 005                | 5.6      | Excessive          | 8        |               |
| 282        | 004     | 005                | 1        | Small              | 2.8      |               |
| 283        | 004     | 005                | 6.5      |                    |          |               |
| 284        | 007     | 008                | 3.7      | Excessive          | 8        |               |
| 285        | Trace   | 006                | 4.1      | Small              | 8        |               |
| 286        | N. P.   | 04                 | 5.5      |                    |          |               |
| 287        | 1.258   | +                  | 1        | Excessive          | 17       |               |
| 288        | 021     | 100                | 1        | Excessive          | 5        |               |
| 289        | Trace   | 0.3                | 1        | Excessive          | 17       | Typhoid fever |
| 290        | 0       | 07                 | 1        | Excessive          | 17       |               |
| 291        | 096     | 009                | 3.2      | Slightly excessive | 1        |               |
| 292        | 001     | 006                | 5        | Small              | 1        |               |
| 293        | 002     | 007                | 7        | Trace              | 1.9      | slight        |
| 294        | 007     | 022                | 1        | Small              | 1.9      |               |
| 295        | 003     | +                  | 4        | Small              |          |               |
| 296        | 048     | 017                | 5        | Excessive          | 5        |               |
| 297        | Trace   | 04                 | 1        | Small              | 5        |               |
| 298        | N. P.   | 1                  | 4        | Excessive          | 2        |               |
| 299        | Trace   | 035                | 14.4     |                    |          |               |
| 300        | +       | 011                | 8.2      |                    |          |               |
| 303        | 028     | 0165               | 10       | Very excessive     | 7        |               |
| 304        | 024     | 021                | 5        |                    | 9        |               |
| 305        | 004     | 010                | 8        | Excessive          | 4        |               |
| 306        | 277     | 010                | 1        | Very excessive     | 8.1      |               |
| 307        | 1.094   | 035                | 1.4      | Excessive          | 5.5      |               |
| 308        | 005     | 014                | 1.4      | Excessive          | 5.5      |               |
| 309        | 003     | 0094               | +        | Excessive          | 2.5      |               |
| 310        | 1.086   | 044                | +        | Excessive          | 5        |               |
| 311        | Al      | 306                | 4.8      | Small              |          |               |
| 313        | Trace   | 0085               | 1        | Excessive          | 8        |               |
| 314        | 276     | +                  | 1        | Excessive          | 2        |               |
| 315        | 0       | +                  | 1        | Excessive          | 8        |               |
| 316        | 000     | 11                 | +        |                    | 2        |               |
| 317        | 0015    | 0106               | 3.0      | Trace              | 2.3      |               |
| 318        | 210     | 015                | 7        | Excessive          | 1.5      |               |
| 321        | 0025    | 028                | 10.5     |                    | 1        |               |
| 322        | 0105    | 021                | 1.4      |                    | 1        |               |
| 323        | 0015    | 017                | 5.2      | Very excessive     | 2        |               |
| 324        | 778     | 022                | 7.0      |                    | 2        | Typhoid fever |
| 325        | 002     | 023                | 1        | Slightly excessive | 5        |               |
| 326        | 017     | +                  | 1        | Excessive          | 8        |               |
| 327        | 003     | 05                 | 6        | Excessive          | 6        |               |
| 328        | 002     | 02                 | 6        | Excessive          | 4        |               |
| 329        | Trace   | 010                | 1.5      | Trace              | 7        |               |
| 331        | None    | 010                | 2.8      | Slightly excessive | 7        |               |
| 332        | 005     | 025                | 1        | Excessive          | 2.5      | Typhoid fever |
| 333        | 005     | 11                 | 1        | Excessive          | 2.5      |               |
| 334        | 012     | 018                | 3.6      | Slightly excessive | 3.5      |               |
| 335        | None    | 010                | 10.0     | Small              | 6        |               |
| 336        | 002     | 008                | 7.0      | Excessive          | 2.3      |               |
| 337        | 004     | 010                | 5.2      |                    | 1.6      | " "           |
| 338        | 0025    | 003                | 14.4     |                    | 5        |               |

\* Reanalyzed

+ Not Determined

## ANALYSES OF WELL WATER. CONTINUED

[PARTS PER 100,000.]

| NO.  | AMMONIA |         | CHLORINE | NITROGEN           |          | REMARKS       |
|------|---------|---------|----------|--------------------|----------|---------------|
|      | FREE    | AMMONIA |          | AS                 | AS       |               |
|      | AMMONIA | AMMONIA |          | NITRATES           | NITRATES |               |
| 343  | Trace   | 110     | 7.5      | Trace              | 5        |               |
| 345  | 301     | 111     | 7.2      | Small              | 5.5      |               |
| 346  | 304     | 120     | 12.2     | Excessive          | 8.1      | Typhoid Fever |
| 347  | 312     | 130     | 10.1     | Very excessive     | 12.0     |               |
| 348  | Trace   | 006     | 4.1      | Small              | 3.2      |               |
| 349  | 0.15    | 007     | 2.6      | Trace              | 2.0      |               |
| 350  | 30      | 308     | 8.6      | Small              | 3.2      |               |
| 351  | 0085    | 0075    | 1.3      | Excessive          | 1.2      |               |
| 352  | 001     | 109     | 2.2      | Slightly excessive | 5.1      |               |
| 353  | 302     | 0065    | 2.4      | Small              | 2.4      |               |
| 354  | 0026    | 113     | 3.4      | Excessive          | 7.0      |               |
| 355  | 006     | 021     | 1.5      | Very excessive     | 1.0      |               |
| 356  | 1.794   | 035     | 2.0      | "                  | 8.0      |               |
| 357  | 2.445   | 055     | 11.0     | "                  | 2.3      |               |
| 358  | 04      | 01      | 1.0      | "                  | 8.5      |               |
| 359  | 0.2     | 008     | 2.5      | Excessive          | 1.5      |               |
| 360  | 304     | 023     | 7.3      | "                  | 7.0      |               |
| 361  | 304     | 12      | 5.1      | "                  | 4.2      |               |
| 362  | 002*    | 020     | 5.5      | "                  | 4.2      |               |
| 363  | 0.9     | 145     | 24.1     | "                  | 14.0     |               |
| 364  | 0.4     | 0.5     | 12.5     | Very excessive     | 7.5      | Typhoid Fever |
| 365  | 0005    | 3955    | 14.0     | Trace              | 6.0      |               |
| 366  | 01      | 27      | 17.4     | Very excessive     | 5.0      |               |
| 367  | 17      | 028     | 7.4      | "                  | 1.1      |               |
| 368  | 003     | 058     | 6.0      | Excessive          | 3.0      |               |
| 370  | 00.5    | 0065    | 1.8      | Trace              | 2.0      |               |
| 371  | 28      | 15      | 9.0      | Very excessive     | 6.5      |               |
| 372  | 304     | 308     | 2.0      | Small              | 1.5      | Typhoid Fever |
| 373  | Trace   | 007     | 5        | None               | 7        |               |
| 374  | "       | 019     | 4.1      | Excessive          | 5.0      |               |
| 374* | "       | 3125    | 1.8      | Slightly excessive | 5.0      |               |
| 375  | 301     | 3045    | 0        | Small              | 1.7      |               |
| 376  | 0019    | 012     | 4.1      | Trace              | 5.5      |               |
| 377  | 0.4     | 0.5     | 7.0      | Excessive          | 9.0      |               |
| 378  | 005     | 015     | 9.3      | Small              | 5.5      |               |
| 379  | 0.35    | 0.1     | 6.0      | Excessive          | 8.5      |               |
| 380  | 004     | 0.35    | 2.6      | "                  | 3.0      |               |
| 381  | 302     | 007     | 2.5      | Slightly excessive | 6.0      |               |
| 382  | 301     | 007     | 7.6      | "                  | 6.0      |               |
| 383  | Trace   | 3035    | 8.8      | Trace              | 4.5      |               |
| 384  | 027     | 008     | 1.0      | Excessive          | 8.0      |               |
| 385  | 0.6     | 008     | 9.4      | "                  | 7.5      |               |
| 386  | 0.3     | 009     | 5.2      | Slightly excessive | 4.5      |               |
| 387  | 002     | 005     | 2.8      | Small              | 3.5      |               |
| 388  | 002     | 006     | 0.0      | "                  | 3.0      |               |
| 389  | 079     | 023     | 7.0      | Very excessive     | 2.5      |               |
| 390  | 075     | 015     | 11.1     | Excessive          | 5.5      |               |
| 391  | 75+     | +       | 17.1     | Very excessive     | 10.0     |               |
| 392  | 005     | 314     | 8.4      | "                  | 6.5      |               |
| 393  | 0035    | 012     | 5.5      | Trace              | 8.1      |               |
| 394  | 304     | 306     | 6.3      | Slightly excessive | 3.5      |               |
| 395  | 304     | 007     | 14.5     | Very               | 3.5      |               |
| 396  | 00.5    | 1150    | 6.4      | Slightly           | 5.5      |               |
| 397  | 0.1     | 0095    | 1.0      | Small              | 14.0     | Typhoid Fever |
| 398  | 016     | 0.4     | 3.0      | Excessive          | 7.0      |               |
| 399  | 53+     | +       | 28.3     | "                  | 16.0     | "             |
| 400  | 005     | 007     | 12.5     | Very excessive     | 10.0     |               |
| 401  | 002     | 011     | 9.5      | Small              | 5.5      |               |
| 402  | 001     | 005     | 3.8      | "                  | 8.0      |               |
| 403  | 042     | 018     | 3.0      | Very excessive     | 2.2      | Typhoid Fever |
| 404  | 0015    | 0035    | 8.2      | Small              | 1.5      |               |
| 406  | 324+    | +       | 9.0      | Very excessive     | 12.0     |               |
| 407  | 17      | 045     | 4.5      | Excessive          | 2.5      |               |
| 408  | 37      | 025     | 25.5     | Very excessive     | 12.0     |               |
| 409  | 37      | 014     | 5.5      | Excessive          | 5.0      |               |
| 410  | 0.6     | 012     | 3.6      | Very excessive     | 2.3      |               |
| 411  | 302     | 005     | 5.3      | Slightly           | 1.3      |               |
| 412  | 020     | 010     | 5.4      | Very               | 6.8      |               |
| 413  | 00.5    | 0075    | 4.5      | Excessive          | 4.0      |               |

\* Reanalyzed

+ Not Determined

## ANALYSES OF WELL WATER. CONTINUED

PARTS PER 100,000.

| SAMPLE NO. | FREE    |          | ALBUMINOID AMMONIA | CHLORINE | NITROGEN           |       | REMARKS       |  |
|------------|---------|----------|--------------------|----------|--------------------|-------|---------------|--|
|            | AMMONIA | AS       |                    |          | AS                 |       |               |  |
|            |         | NITRITES |                    |          | NITRATES.          |       |               |  |
| 415        | 001     | 006      |                    | 1.8      | Slightly excessive | 1     |               |  |
| 416        | 001     | 006      |                    | 8.0      | Excessive          | 5     |               |  |
| 417        | 0006    | 014      |                    | 12.0     | "                  | 12    |               |  |
| 418        | 002     | 010      |                    | 8.0      | Trace              | 06    |               |  |
| 419        | 002     | 0025     |                    | 3.7      | Small              | 7.00  |               |  |
| 420        | 003     | 007      |                    | 1.5      | "                  | 1.00  |               |  |
| 421        | 005     | 0145     |                    | 75       | Trace              | 1     |               |  |
| 422        | 002     | 011      |                    | 7.0      | Excessive          | 3     |               |  |
| 423        | 003     | 006      |                    | 1.2      | Small              | 1     |               |  |
| 424        | 018     | 0095     |                    | 4.0      | Very excessive     | 2     |               |  |
| 425        | 004     | 007      |                    | 1.0      | Excessive          |       |               |  |
| 426        | 003     | 0156     |                    | 1.2      |                    | 7.5   |               |  |
| 427        | 0005    | 015      |                    | 6.6      | Very excessive     | 6.0   | Typhoid Fever |  |
| 428        | 004     | 015      |                    | 1.1      | Excessive          | 7.0   |               |  |
| 429        | 002     | 013      |                    | 6.5      | Very excessive     | 4.0   | " "           |  |
| 430        | 0014    | 024      |                    | 3        |                    | 4.7   |               |  |
| 431        | 375+    | +        |                    | 4.0      |                    | 5.4   |               |  |
| 432        | 007     | 011      |                    | 1.8      | "                  | 4.1   |               |  |
| 433        | Trace   | 007      |                    | 3.7      | Small              |       |               |  |
| 434        | 001     | 010      |                    | 7.7      |                    |       |               |  |
| 435        | 016     | 0045     |                    | 11.0     | Very excessive     | 7     |               |  |
| 435*       | 010     | 0005     |                    | 11.0     | "                  |       |               |  |
| 436        | 010     | 016      |                    | 4.6      | Excessive          |       |               |  |
| 437        | 002     | 019      |                    | 1.5      | "                  | 3     |               |  |
| 434        | 005     | 008      |                    | 3.6      | Very excessive     |       |               |  |
| 439        | 013     | 023      |                    | 1.2      | "                  | 3.0   | CHLOR. m.     |  |
| 440        | 200+    | +        |                    | 8.0      | "                  | 11    |               |  |
| 441        | 0065    | 011      |                    | 2.6      | Excessive          | 3     |               |  |
| 442        | 010     | 018      |                    | 4.0      | Small              | 1.0   |               |  |
| 443        | 004     | 015      |                    | 6.2      | Very excessive     | 0     |               |  |
| 444        | 0026    | 008      |                    | 3.2      | "                  | 2.8   |               |  |
| 445        | 004     | 0025     |                    | 2.0      | Small              |       |               |  |
| 446        | 029     | 009      |                    | 16.0     | Very excessive     |       |               |  |
| 447        | 200+    | +        |                    | 5.0      | Trace              | Trace |               |  |
| 448        | 13+     | +        |                    | 6.4      | Very excessive     | 2.6   |               |  |
| 449        | 0025    | 011      |                    | 4.2      | Small              | 5.0   | Typhoid Fever |  |
| 450        | 001     | 010      |                    | 6.0      |                    | 6.6   |               |  |
| 451        | 03      | 01       |                    | 1.7      |                    | 7.3   |               |  |
| 452        | 30      | 0645     |                    | 4.4      | Very excessive     | 1.5   |               |  |
| 453        | 008     | 1.4      |                    | 5.1      | None               | 6.7   |               |  |
| 454        | +       | +        |                    | 4.4      | Very excessive     | 7.4   |               |  |
| 455        | 42      | 020      |                    | 5.2      | Small              | 4.5   |               |  |
| 456        | 002     | 006      |                    | 1.5      | Trace              | 3.1   |               |  |
| 457        | 006     | 17       | Trace              |          | None               | 5     | Cistern       |  |
| 457*       | 001     | 1.1      |                    | 6.0      | Trace              | 5.3   |               |  |
| 458        | 0005    | 0.15     |                    | 3.4      | Slightly excessive | 3.1   |               |  |
| 459        | 011     | 12       |                    | 4.1      | Excessive          | 6.2   |               |  |
| 460        | 003     | 021      |                    | 0.5      |                    | 7.5   |               |  |
| 461        | 001     | 0065     |                    | 1        | Small              | 1.1   |               |  |
| 462        | 002     | 0045     |                    | 2.2      |                    | 1.5   |               |  |

\* Reanalyzed + Not Determined

---

*ENUMERATION OF COW STABLES.*

---

## COW STABLES IN CITY.

[illegible]

| Euclid Ave. Farm          | 21 | Yes | Yes                    | Well           | Cesspool     | 5x8   | Frame | Doors & Windows | Plank | Mixed Feed | Fair | No Yes |
|---------------------------|----|-----|------------------------|----------------|--------------|-------|-------|-----------------|-------|------------|------|--------|
| Elizabeth St 17 21        | 40 | No  | No                     |                |              | 4x18  |       |                 |       |            |      |        |
| " 23                      | 48 |     | Confined               |                |              | 22x18 |       |                 |       |            |      |        |
| " 68                      | 48 |     | Occasionally in summer |                | Cesspool     | 22x18 |       |                 |       |            |      |        |
| Elizabeth Ave 213         | 12 | Yes | Yes at all times       |                |              | 22x18 |       |                 |       |            |      |        |
| " 289                     | 12 |     |                        |                |              | 22x18 |       |                 |       |            |      |        |
| Estor St 14               | 12 | No  | Occasionally in summer | City           |              | 12x18 |       |                 |       |            |      |        |
| Emmett St 234             | 48 |     |                        | Well           |              | 16x18 |       |                 |       |            |      |        |
| Eighteenth Ave 440 Dealer | 2  |     | No                     | City           | Sewer        | 22x18 |       |                 |       |            |      |        |
| Ferry St 140              | 2  |     | Occasionally in summer |                | Cesspool     | 22x18 |       |                 |       |            |      |        |
| Ferry St 535, Farm        | 12 |     |                        | Well & City    | Cesspool     | 22x18 |       |                 |       |            |      |        |
| Ferry St 554, Farm        | 12 |     |                        | City           | Cesspool     | 22x18 |       |                 |       |            |      |        |
| " 514                     | 12 |     |                        | Well & City    | Cesspool     | 22x18 |       |                 |       |            |      |        |
| " 519, Farm               | 12 |     | Confined               | Well           | Ground       | 22x18 |       |                 |       |            |      |        |
| " 528, Farm               | 12 |     | Occasionally in summer |                |              | 22x18 |       |                 |       |            |      |        |
| " 502                     | 12 |     | Confined               |                |              | 22x18 |       |                 |       |            |      |        |
| " 512                     | 12 |     | Occasionally in summer |                | Cesspool     | 22x18 |       |                 |       |            |      |        |
| " 514                     | 12 |     |                        |                |              | 22x18 |       |                 |       |            |      |        |
| Franklin St 10            | 12 |     | Confined               |                | Ground       | 22x18 |       |                 |       |            |      |        |
| " 270                     | 12 |     |                        |                |              | 22x18 |       |                 |       |            |      |        |
| " 216                     | 12 |     | Occasionally in summer |                | Cesspool     | 22x18 |       |                 |       |            |      |        |
| Ferguson St 104 10        | 12 |     | Confined               |                | Floor        | 22x18 |       |                 |       |            |      |        |
| Fairview Ave 88           | 12 |     | Occasionally in summer |                | Sewer        | 22x18 |       |                 |       |            |      |        |
| First St 68               | 12 |     | Confined               | City           |              | 12x18 |       |                 |       |            |      |        |
| " 11                      | 12 |     | Occasionally in summer |                |              | 12x18 |       |                 |       |            |      |        |
| First Ave 40 10 10        | 12 | Yes | Yes                    | Well           | Gr of stable | 22x18 |       |                 |       |            |      |        |
| Fifty St 10               | 12 | No  | Confined               | City           | Ground       | 22x18 |       |                 |       |            |      |        |
| Fifteen N. Ave 40         | 12 |     | Occasionally in summer |                | Sewer        | 22x18 |       |                 |       |            |      |        |
| Goldthorn St 10           | 12 |     |                        | Well & City    | Cesspool     | 22x18 |       |                 |       |            |      |        |
| " 275                     | 12 |     |                        | Well           |              | 22x18 |       |                 |       |            |      |        |
| " 291                     | 12 | No  | Confined               |                |              | 22x18 |       |                 |       |            |      |        |
| George St 88              | 12 |     |                        | City           | Manure pit   | 22x18 |       |                 |       |            |      |        |
| Gardner St 89             | 12 |     |                        | City           | Ground       | 22x18 |       |                 |       |            |      |        |
| Hamburg Place Farm 227    | 12 |     | Occasionally in summer | Well & City    |              | 22x18 |       |                 |       |            |      |        |
| " 223                     | 12 | Yes | Yes                    | City           |              | 22x18 |       |                 |       |            |      |        |
| Hamburg Pl. Road Farm     | 12 |     | No                     | Well           |              | 22x18 |       |                 |       |            |      |        |
| " 10                      | 12 | No  |                        |                |              | 22x18 |       |                 |       |            |      |        |
| " 10                      | 12 | Yes | Yes all seasons        |                |              | 22x18 |       |                 |       |            |      |        |
| " 10                      | 12 | No  | Occasionally in summer |                |              | 22x18 |       |                 |       |            |      |        |
| " 10                      | 12 |     |                        | City           | Floor        | 22x18 |       |                 |       |            |      |        |
| Holland St 44             | 12 |     |                        | Well           | Ground       | 22x18 |       |                 |       |            |      |        |
| Hawthorn Ave., n Bergen   | 12 | Yes | Yes summer months      |                |              | 22x18 |       |                 |       |            |      |        |
| Highland St 15            | 12 |     |                        |                |              | 22x18 |       |                 |       |            |      |        |
| Hunter St 50              | 12 | No  | Occasionally in summer |                | Pit          | 22x18 |       |                 |       |            |      |        |
| Hoyt St 71                | 12 |     |                        | Cistern        | All to pit   | 22x18 |       |                 |       |            |      |        |
| Hunterdon St 444          | 12 |     |                        | City           | Sewer        | 22x18 |       |                 |       |            |      |        |
| " 405                     | 12 |     |                        |                | Cesspool     | 22x18 |       |                 |       |            |      |        |
| " 474                     | 12 |     |                        | Well           |              | 22x18 |       |                 |       |            |      |        |
| Irving St 58              | 10 |     |                        | City           |              | 22x18 |       |                 |       |            |      |        |
| Jackson St 72             | 10 |     |                        | Well           | To pit       | 22x18 |       |                 |       |            |      |        |
| Jeliff Ave 216            | 10 |     |                        |                | Ground       | 22x18 |       |                 |       |            |      |        |
| " 216                     | 10 |     |                        |                |              | 22x18 |       |                 |       |            |      |        |
| Jeliff Ave 223            | 10 |     |                        |                | Cesspool     | 22x18 |       |                 |       |            |      |        |
| " 10                      | 10 |     |                        |                |              | 22x18 |       |                 |       |            |      |        |
| Joseph St 34              | 10 |     |                        | City           | Ground       | 22x18 |       |                 |       |            |      |        |
| " 50                      | 10 |     |                        | Well & Cistern | P & Ground   | 22x18 |       |                 |       |            |      |        |



# COW STABLES IN CITY CONTINUED.

| LOCATION                  | DISTANCE FROM DWELLING IN FEET | EXERCISE & PASTURE A.C. | DO ANIMALS GET OUT OF STALLS DURING WHICH MONTH | WATER SUPPLY  | METHOD OF DRAINAGE | SIZE OF STABLES | NUMBER OF ANIMALS | MATERIAL    | NUMBER OF STALLS | POINTER IN FEET | NUMBER OF COWS | CONDITION OF COWS | HAVE COMFORTABLE REFUGES |
|---------------------------|--------------------------------|-------------------------|---|---------------|--------------------|-----------------|-------------------|-------------|------------------|-----------------|----------------|-------------------|--------------------------|
| Kosarth St. 7             | 24                             | No                      | Occasionally in summer                          | Well          | Cesspool           | 8x17            | 1                 | Frame       | 6                | 12              | 1              | Fair              | 1                        |
| " 28                      | 24                             | No                      | Confined  | "             | "                  | 18x20           | 1                 | Frame       | "                | "               | "              | "                 | "                        |
| " 85                      | 45                             | No                      | Occasionally in summer                          | "             | Sewer              | 18x20           | 1                 | Frame, poor | "                | "               | "              | "                 | "                        |
| Livingston St. 158        | 45                             | No                      | Confined  | City          | To pit             | 13x7            | 1                 | Frame       | "                | "               | "              | "                 | "                        |
| " 178                     | 46                             | No                      | Occasionally in summer                          | Well          | Septic & Swamp     | 14x20           | 1                 | Frame       | "                | "               | "              | "                 | "                        |
| " 288                     | 46                             | No                      | Occasionally in summer                          | Well          | Cesspool           | 14x20           | 1                 | Frame       | "                | "               | "              | "                 | "                        |
| Lake St. 270              | 46                             | Yes                     | Occasionally in summer                          | Well          | Cesspool           | 14x20           | 1                 | Frame       | "                | "               | "              | "                 | "                        |
| " 900                     | 46                             | Yes                     | Occasionally in summer                          | Well          | Cesspool           | 14x20           | 1                 | Frame       | "                | "               | "              | "                 | "                        |
| Lille St. 19              | 46                             | No                      | Occasionally in summer                          | City          | To pit             | 14x20           | 1                 | Frame       | "                | "               | "              | "                 | "                        |
| " 112                     | 46                             | No                      | Occasionally in summer                          | City          | To pit             | 14x20           | 1                 | Frame       | "                | "               | "              | "                 | "                        |
| " 112                     | 46                             | No                      | Occasionally in summer                          | City          | To pit             | 14x20           | 1                 | Frame       | "                | "               | "              | "                 | "                        |
| " 112                     | 46                             | No                      | Occasionally in summer                          | City          | To pit             | 14x20           | 1                 | Frame       | "                | "               | "              | "                 | "                        |
| Lewis St. 26              | 46                             | No                      | Occasionally in summer                          | "             | Sewer              | 14x20           | 1                 | Frame       | "                | "               | "              | "                 | "                        |
| " 16                      | 46                             | No                      | Occasionally in summer                          | "             | Sewer              | 14x20           | 1                 | Frame       | "                | "               | "              | "                 | "                        |
| Lentz Ave. 17             | 46                             | No                      | Occasionally in summer                          | Well          | To pit             | 14x20           | 1                 | Frame       | "                | "               | "              | "                 | "                        |
| " 33                      | 46                             | No                      | Occasionally in summer                          | Well          | To pit             | 14x20           | 1                 | Frame       | "                | "               | "              | "                 | "                        |
| " 54                      | 46                             | No                      | Occasionally in summer                          | Well          | To pit             | 14x20           | 1                 | Frame       | "                | "               | "              | "                 | "                        |
| Littleton Ave. 5          | 46                             | No                      | Occasionally in summer                          | Well          | Cesspool           | 14x20           | 1                 | Frame       | "                | "               | "              | "                 | "                        |
| Lock St. 68               | 46                             | No                      | Occasionally in summer                          | City          | To pit             | 14x20           | 1                 | Frame       | "                | "               | "              | "                 | "                        |
| Magazine St. 8            | 46                             | No                      | Occasionally in summer                          | Well          | To pit             | 14x20           | 1                 | Frame       | "                | "               | "              | "                 | "                        |
| " 8                       | 46                             | No                      | Occasionally in summer                          | Well          | To pit             | 14x20           | 1                 | Frame       | "                | "               | "              | "                 | "                        |
| Marie St. 98              | 46                             | No                      | Occasionally in summer                          | "             | Sewer              | 14x20           | 1                 | Frame       | "                | "               | "              | "                 | "                        |
| " 98                      | 46                             | No                      | Occasionally in summer                          | "             | Sewer              | 14x20           | 1                 | Frame       | "                | "               | "              | "                 | "                        |
| " 98                      | 46                             | No                      | Occasionally in summer                          | "             | Sewer              | 14x20           | 1                 | Frame       | "                | "               | "              | "                 | "                        |
| Montgomery St. 11         | 46                             | No                      | Occasionally in summer                          | City          | To pit             | 14x20           | 1                 | Frame       | "                | "               | "              | "                 | "                        |
| Montgomery Ave.           | 46                             | No                      | Occasionally in summer                          | Well          | To pit             | 14x20           | 1                 | Frame       | "                | "               | "              | "                 | "                        |
| Magnolia St. 20           | 46                             | No                      | Occasionally in summer                          | City          | To pit             | 14x20           | 1                 | Frame       | "                | "               | "              | "                 | "                        |
| Morris Ave. 4.8           | 46                             | No                      | Occasionally in summer                          | City          | To pit             | 14x20           | 1                 | Frame       | "                | "               | "              | "                 | "                        |
| Mugara St. 7              | 46                             | No                      | Occasionally in summer                          | Well and City | To pit             | 14x20           | 1                 | Frame       | "                | "               | "              | "                 | "                        |
| Nea St. 89                | 46                             | No                      | Occasionally in summer                          | Well          | To pit             | 14x20           | 1                 | Frame       | "                | "               | "              | "                 | "                        |
| Nineteenth Ave. 45        | 46                             | No                      | Occasionally in summer                          | Well          | To pit             | 14x20           | 1                 | Frame       | "                | "               | "              | "                 | "                        |
| " 46                      | 46                             | No                      | Occasionally in summer                          | Well          | To pit             | 14x20           | 1                 | Frame       | "                | "               | "              | "                 | "                        |
| North Seventh St. 320     | 46                             | No                      | Occasionally in summer                          | Well          | To pit             | 14x20           | 1                 | Frame       | "                | "               | "              | "                 | "                        |
| North Thirteenth St. Farm | 46                             | Yes                     | Yes all times                                   | Well          | Sewer              | 14x20           | 1                 | Frame       | "                | "               | "              | "                 | "                        |
| Oxford St. 9              | 46                             | No                      | Occasionally in summer                          | Well          | To pit             | 14x20           | 1                 | Frame       | "                | "               | "              | "                 | "                        |
| " 12                      | 46                             | No                      | Occasionally in summer                          | Well          | To pit             | 14x20           | 1                 | Frame       | "                | "               | "              | "                 | "                        |
| " 12                      | 46                             | No                      | Occasionally in summer                          | Well          | To pit             | 14x20           | 1                 | Frame       | "                | "               | "              | "                 | "                        |
| Onondaga St. 130          | 46                             | No                      | Occasionally in summer                          | Well and City | To pit             | 14x20           | 1                 | Frame       | "                | "               | "              | "                 | "                        |
| " 12                      | 46                             | No                      | Occasionally in summer                          | Well          | To pit             | 14x20           | 1                 | Frame       | "                | "               | "              | "                 | "                        |
| Pashine Ave. 7            | 46                             | No                      | Occasionally in summer                          | City          | Cesspool           | 14x20           | 1                 | Frame       | "                | "               | "              | "                 | "                        |

| Peshline Ave 19                          | 32 Ft | No    | Occasionally in summer | City          | Cesspool       | 11x11'           | 1 Frame             | Doors & Wind's | Plank         | Mixed roof | 4  | Fair | No | Yes |
|--|-------|-------|------------------------|---------------|----------------|------------------|---------------------|----------------|---------------|------------|----|------|----|-----|
| " " 23                                   | 34'   | "     | "                      | "             | To pit         | 11x11'           | 1 Frame             | "              | "             | "          | 1  | "    | "  | "   |
| " " 65                                   | 42'   | "     | "                      | "             | Floor & ground | 12x22'           | 1 Frame             | "              | "             | "          | 3  | "    | "  | "   |
| Peat cor S. 13th St                      | 44'   | "     | Confined               | Well          | Cesspool       | 12x22'           | 1 Frame             | "              | "             | "          | 3  | "    | "  | "   |
| Prospect Place 2, Dealer                 | 25'   | "     | "                      | City          | Sewer          | 12x22' ex 12x30' | 2 Frame and 2 Ext   | "              | "             | "          | 19 | Good | "  | "   |
| Prince St. 102                           | 25'   | "     | "                      | Well          | "              | 25x25'           | 2 Frame             | "              | Plank & Brick | "          | 15 | Fair | "  | "   |
| Pierce St 31                             | 75'   | "     | Occasionally in summer | "             | Cesspool       | "                | 1 Frame             | "              | Plank         | "          | 4  | "    | "  | "   |
| Paterson St 63                           | 23'   | "     | Confined               | "             | "              | "                | 1 Frame             | "              | "             | "          | 4  | "    | "  | "   |
| Passale Ave 36                           | 48'   | "     | "                      | City          | "              | "                | 1 Frame             | "              | "             | "          | 4  | "    | "  | "   |
| Rose Hill Ave 166                        | 120'  | "     | Occasionally in summer | Well and City | Sewer          | "                | 1 Frame             | "              | "             | "          | 4  | "    | "  | "   |
| 465 Farm                                 | 5'    | Ex'e  | Yes all times          | Well          | Ground         | 12x22'           | 1 Frame             | "              | Earth & plank | "          | 1  | Good | "  | "   |
| Richmond St 119, Dealer                  | 42'   | No    | Confined               | City          | Sewer          | "                | 1 Frame             | "              | Plank         | "          | 3  | "    | "  | "   |
| Rose St 24                               | 35'   | "     | Occasionally in summer | "             | "              | "                | 1 Frame Shed        | "              | "             | "          | 4  | "    | "  | "   |
| Sanford St 16                            | 60'   | "     | "                      | "             | Cesspool       | 20x11'           | 1 Frame             | "              | "             | "          | 4  | "    | "  | "   |
| Springfield Ave 702                      | 124'  | "     | "                      | "             | Ground         | "                | 1 1/2 Frame and Ext | "              | "             | "          | 4  | "    | "  | "   |
| " " 298                                  | 12'   | Yes   | "                      | Well & Clat'n | Sewer          | 20x20'           | 1 1/2 Frame         | "              | "             | "          | 4  | "    | "  | "   |
| So Orange Ave 3 Dealer                   | 35'   | No    | Confined               | City          | "              | 22x44            | 2 story Frame       | D & W and e    | "             | "          | 14 | "    | "  | "   |
| So Orange Ave 22                         | 32'   | "     | Occasionally in summer | Well          | To Ground      | 6x8              | 1 Frame             | Doors & Wind's | "             | "          | 5  | "    | "  | "   |
| So Orange Ave 179                        | 30'   | 1 1/2 | "                      | "             | "              | 6x8              | 1 Frame             | "              | "             | "          | 4  | "    | "  | "   |
| Second Street Farm                       | 104'  | "     | At all times           | "             | "              | 32x44' ex 14x14' | 2 1/2 Frame         | "              | "             | "          | 19 | Good | "  | "   |
| Second Ave 14                            | 38'   | "     | Summer month           | City          | Cesspool       | 11x12 1/2'       | 1 1/2 Frame         | "              | "             | "          | 4  | Fair | "  | "   |
| South Sixth St 15                        | 34'   | "     | "                      | "             | "              | 11x14'           | 1 1/2 Frame         | "              | "             | "          | 4  | "    | "  | "   |
| South Eighth St 333                      | 40'   | "     | "                      | "             | "              | 12x18'           | 1 story Frame       | "              | "             | "          | 2  | "    | "  | "   |
| " " 19                                   | 2'    | Yes   | "                      | Well          | Ground         | 4x8              | 1 1/2 Frame         | "              | "             | "          | 14 | Good | "  | "   |
| Ninth St 366                             | 38'   | "     | "                      | City          | Cesspool       | 12x22'           | 1 Frame Shed        | "              | "             | "          | 4  | Fair | "  | "   |
| " Tenth St 43                            | 27'   | "     | "                      | "             | Ground         | 12x14'           | 1 Frame             | "              | "             | "          | 8  | "    | "  | "   |
| " Eleventh St 231                        | 14'   | No    | "                      | Well          | "              | 12x22'           | 1 Frame             | "              | "             | "          | 4  | "    | "  | "   |
| " " 585                                  | 6'    | "     | "                      | City          | "              | 13x24'           | 1 Frame             | "              | "             | "          | 4  | "    | "  | "   |
| " Twelfth St 446                         | 32'   | "     | "                      | Well          | Cesspool       | 14x12            | 1 Frame             | Door & Wind's  | "             | "          | 4  | "    | "  | "   |
| So. 13th St., near 18th Ave              | 18'   | "     | "                      | "             | "              | 17x24'           | 1 1/2 Frame         | Door           | "             | "          | 6  | "    | "  | "   |
| South Fourteenth St 746                  | 25'   | "     | "                      | City          | Ground         | 17x13'           | 1 Frame             | Door & Wind's  | "             | "          | 1  | "    | "  | "   |
| So 15th St., near 16th Ave               | 75'   | "     | "                      | Well          | "              | 18x21'           | 2 Frame             | "              | "             | "          | 3  | "    | "  | "   |
| So 16th St., near 16th Ave               | 30'   | "     | "                      | "             | Cesspool       | 10x33'           | 1 1/2 Frame         | "              | "             | "          | 1  | "    | "  | "   |
| " " 47                                   | 30'   | "     | "                      | "             | Ground         | 18x48'           | 1 1/2 Frame         | "              | "             | "          | 5  | "    | "  | "   |
| South Eighteenth St 355                  | 30'   | "     | "                      | City          | "              | 12x12'           | 1 Frame             | "              | "             | "          | 1  | "    | "  | "   |
| " " 478                                  | 38'   | "     | "                      | "             | Cesspool       | 12x16'           | 1 1/2 Frame         | "              | "             | "          | 2  | "    | "  | "   |
| " " 333                                  | 66'   | "     | "                      | "             | "              | 12x16'           | 1 Frame             | D. & W and e   | "             | "          | 2  | "    | "  | "   |
| " " 888                                  | 21'   | "     | "                      | Clat'n        | "              | 11x14'           | 1 Frame             | Door & Wind's  | "             | "          | 2  | "    | "  | "   |
| So. 19th St., near Spring field Ave Farm | 30'   | Yes   | "                      | Well          | Ord rear of St | 20x30'           | 1 Frame             | "              | "             | "          | 2  | "    | "  | "   |
| So 19th S near Spring field Ave          | 16'   | No    | "                      | "             | Cesspool       | 12x29'           | 1 1/2 Frame         | "              | "             | "          | 4  | "    | "  | "   |
| 16th Ave., cor H. Land St                | 22'   | "     | "                      | City          | "              | 13x25'           | 1 Frame             | "              | "             | "          | 6  | "    | "  | "   |
| Third St 382                             | 24'   | "     | "                      | Well          | Ground         | 11x17'           | 1 1/2 Frame         | "              | "             | "          | 1  | "    | "  | "   |
| " " 385                                  | 24'   | "     | "                      | "             | "              | 13x40'           | 1 1/2 Frame         | "              | "             | "          | 9  | "    | "  | "   |
| Van Buren St 82                          | 8'    | "     | "                      | City          | Cesspool       | 14x35            | 1 1/2 Frame         | "              | "             | "          | 4  | "    | "  | "   |
| " " 87                                   | 34'   | Ex'e  | "                      | "             | Sewer          | 13x14'           | 1 1/2 Frame         | "              | "             | "          | 4  | "    | "  | "   |
| Varnum St 14                             | 34'   | No    | "                      | Well          | Cesspool       | 8x26             | 2 story Frame       | "              | "             | "          | 2  | Good | "  | "   |
| Woodside Av. n.r Carteret                | 19'   | Yes   | "                      | "             | Ground         | 13x28'           | 1 1/2 Frame         | "              | "             | "          | 7  | Fair | "  | "   |
| " " 80                                   | 30'   | "     | "                      | "             | "              | 12x22'           | 1 1/2 Frame         | "              | "             | "          | 4  | "    | "  | "   |
| West Kinney St 163                       | 26'   | No    | Confined               | City          | Sewer          | 10x13            | 1 1/2 Frame         | "              | "             | "          | 2  | "    | "  | "   |
| " " 191                                  | 34'   | "     | "                      | "             | "              | 22x20'           | 2 story Frame       | "              | "             | "          | 4  | "    | "  | "   |
| Warren St 53                             | 47'   | Ex'e  | Out summer months      | Well          | To pit         | 20x28'           | 2 story Frame       | "              | "             | "          | 11 | "    | "  | "   |
| Westcott St 70                           | 44'   | No    | "                      | "             | "              | 18x40'           | 2 Frame             | "              | "             | "          | 12 | "    | "  | "   |
| Wall St 28                               | 30'   | "     | Confined               | City          | Sewer          | 24x30'           | 2 Frame             | "              | "             | "          | 15 | Good | "  | "   |

# Meteorological Observations taken at Newark, N. J., January 1894.

By PROF. G. C. SONN, VOL. OBSERVER, U. S. WEATHER BUREAU

| 1 °E.       | Barometer | Temperature |      |      | Humidity | Direction of Wind | Velocity Miles per Hour | Rain    | Precipitation* | GENERAL ITEMS.                                      |
|-------------|-----------|-------------|------|------|----------|-------------------|-------------------------|---------|----------------|---|
|             |           | Max         | Min  | Mean |          |                   |                         |         |                |   |
| 1           | 30.30     | 36          | 23   | 29   | 68       | W                 | 1                       | 0       |                | Mean barometer 30.166 inches                        |
| 2           | 30.34     | 36          | 24   | 30   | 68       | S. W.             | 1                       | 0       |                | Highest barometer, 30.397, on 27th                  |
| 3           | 29.93     | 36          | 26   | 31   | 84       | S. S.             | 12                      | 0       |                | Lowest barometer, 29.747, on 31st                   |
| 4           | 29.85     | 36          | 27   | 31.5 | 8        | S. W.             | 1                       | 0       |                | 5.114 inches of mercury 5th                         |
| 5           | 29.85     | 38          | 25   | 31.5 | 8        | S. W.             | 1                       | 0.03 in |                | Mean thermometer 31.5                               |
| 6           | 29.73     | 38          | 25   | 31.5 | 4        | S. W.             | 1                       | 0       |                | Highest thermometer 38                              |
| 7           | 29.73     | 38          | 25   | 31.5 | 4        | S. W.             | 1                       | 0       |                | Lowest thermometer 25                               |
| 8           | 29.65     | 38          | 25   | 31.5 | 4        | S. W.             | 1                       | 0       |                | Mean range of temperature 17°                       |
| 9           | 29.67     | 37          | 27   | 32   | 4        | S. W.             | 1                       | 0       |                | Great est. & least temperature, 35°                 |
| 10          | 29.69     | 37          | 27   | 32   | 82       | S. S. W.          | 1                       | 0.12 S  |                | Least & greatest of 1893 15.6                       |
| 11          | 29.78     | 36          | 27   | 31.5 | 82       | Variable          | 20                      | 0.01    |                | Mean daily range of temperature, 17°                |
| 12          | 29.74     | 29          | 27   | 28   | 65       | S. W.             | 10                      | 0       |                | Total 0.193 inches                                  |
| 13          | 29.75     | 34          | 25   | 29.5 | 67       | S. W.             | 20                      | 0       |                | Mean daily relative humidity, 65 per cent           |
| 14          | 29.66     | 34          | 25   | 29.5 | 47       | S. W.             | 1                       | 0.09    |                | Prevailing direction of wind S. W.                  |
| 15          | 29.61     | 34          | 25   | 29.5 | 47       | S. W.             | 1                       | 0.10    |                | Number of foggy days, 3                             |
| 16          | 29.61     | 34          | 25   | 29.5 | 47       | S. W.             | 20                      | 0       |                | Number of clear days, 11                            |
| 17          | 29.61     | 34          | 25   | 29.5 | 47       | S. W.             | 20                      | 0       |                | Number of fair days, 10                             |
| 18          | 29.61     | 34          | 25   | 29.5 | 47       | S. W.             | 10                      | 0       |                | Number of cloudy days, 13                           |
| 19          | 29.61     | 34          | 25   | 29.5 | 47       | S. W.             | 10                      | 0.09    |                | Total number of days on which rain or snow fell, 13 |
| 20          | 29.61     | 34          | 25   | 29.5 | 47       | S. W.             | 12                      | 0       |                | Thunder storm, 0                                    |
| 21          | 29.61     | 34          | 25   | 29.5 | 47       | S. W.             | 12                      | 0.05    |                | Mean Max. Temp., 36                                 |
| 22          | 29.61     | 34          | 25   | 29.5 | 47       | S. W.             | 12                      | 0       |                | Mean Min. Temp., 25                                 |
| 23          | 29.61     | 34          | 25   | 29.5 | 47       | S. W.             | 12                      | 0       |                |   |
| 24          | 29.61     | 34          | 25   | 29.5 | 47       | S. W.             | 12                      | 0       |                |   |
| 25          | 29.61     | 34          | 25   | 29.5 | 47       | S. W.             | 12                      | 0       |                |   |
| 26          | 29.61     | 34          | 25   | 29.5 | 47       | S. W.             | 12                      | 0       |                |   |
| 27          | 29.61     | 34          | 25   | 29.5 | 47       | S. W.             | 12                      | 0       |                |   |
| 28          | 29.61     | 34          | 25   | 29.5 | 47       | S. W.             | 12                      | 0       |                |   |
| 29          | 29.61     | 34          | 25   | 29.5 | 47       | S. W.             | 12                      | 0       |                |   |
| 30          | 29.61     | 34          | 25   | 29.5 | 47       | S. W.             | 12                      | 0       |                |   |
| 31          | 29.61     | 34          | 25   | 29.5 | 47       | S. W.             | 12                      | 0       |                |   |
| Total Means | 30.166    | 30.2        | 27.0 | 33.2 | 66       |                   | 1                       | 1.92    |                |   |

Average Temperature for 2 years 2.2°

Average Precipitation for 2 years 4.6 in

\* Indicated Trace of Precipitation

\* Rain and Melting Snow.

## REMARKS.

Maximum wind velocity 4 miles.

Total Snowfall 7.5 inches.

Hail on 29th.

Auroras on 3d, 5th

Large Hail on 30th

# Meteorological Observations taken at Newark, N. J., February 1894.

By PROF. G. C. SONN, VOL. OBSERVER, U. S. WEATHER BUREAU

| FE.         | Daily Mean Temperature. |      |      | Daily Mean Prevailing Direction of Wind | Velocity Miles per Hour. | Daily Precipitation* | GENERAL ITEMS                                       |
|-------------|-------------------------|------|------|---|--------------------------|----------------------|---|
|             | Barometer               | Max. | Min. | Mean                                    |                          |                      |   |
| 1           | 30.01                   | 31   | 24   | 27                                      | N. W.                    | 0.07 in              | Mean Barometer 30.16 inches.                        |
| 2           | 30.22                   | 33   | 26   | 29.5                                    | S. W.                    | 0                    | Highest barometer 33.29 inches.                     |
| 3           | 29.84                   | 31   | 29   | 30.0                                    | S. W.                    | 0                    | Lowest Barometer, 29.36 inches.                     |
| 4           | 29.80                   | 31   | 29   | 30.0                                    | N. W.                    | 0.08 S               | Monthly Range of Barometer, 1.93 inches.            |
| 5           | 30.24                   | 34   | 26   | 30.0                                    | N. W.                    | 0                    | Mean Temperature 29.3°                              |
| 6           | 30.15                   | 35   | 29   | 32.0                                    | S. W.                    | 0                    | Highest Temperature, 35°, on 18th.                  |
| 7           | 30.1                    | 34   | 24   | 29.5                                    | S. W.                    | 0                    | Lowest Temperature, 24° on 25th.                    |
| 8           | 29.98                   | 34   | 24   | 29.0                                    | S. W.                    | 0                    | Monthly Range of Temperature 3°.                    |
| 9           | 29.93                   | 34   | 24   | 29.0                                    | N. W.                    | 0                    | Greatest Daily Range of Temperature 30°, on 17th.   |
| 10          | 30.08                   | 35   | 29   | 32.0                                    | N. W.                    | 0.04                 | Least Daily Range of Temperature, 4° on 5th.        |
| 11          | 30.1                    | 34   | 29   | 31.5                                    | S. W.                    | 0                    | Monthly Range of Temperature 10°.                   |
| 12          | 30.05                   | 34   | 29   | 31.5                                    | N. E.                    | 0.53 S               | Total Precipitation 1.14 inches.                    |
| 13          | 30.09                   | 34   | 29   | 31.5                                    | N. E.                    | 0                    | Mean Daily Rain - Hurricane, 50 per cent.           |
| 14          | 30.05                   | 34   | 29   | 31.5                                    | N. N. E.                 | 0.09 S               | Prevailing Direction of Wind, S. W.                 |
| 15          | 30.49                   | 35   | 29   | 32.0                                    | N. W.                    | 0.50 S               | Number of Foggy Days 6.                             |
| 16          | 30.39                   | 36   | 30   | 33.0                                    | N. W.                    | 1.5                  | Number of Fair Days 8.                              |
| 17          | 30.44                   | 37   | 31   | 34.0                                    | S.                       | 0                    | Number of Cloudy Days 1.                            |
| 18          | 30.05                   | 32   | 32   | 32.0                                    | S. W.                    | 0.28                 | Total Number of Days on which Rain or Snow Fell 13. |
| 19          | 30.04                   | 30   | 31   | 30.5                                    | N. W.                    | 0.10                 | Thunder Storm, 18th, 23rd.                          |
| 20          | 30.8                    | 33   | 33   | 33.0                                    | S. W.                    | 0                    | Mean Max. Temperature, 35.1°                        |
| 21          | 30.1                    | 30   | 24   | 27.0                                    | N. W.                    | 0                    | Mean Min. Temperature, 20.8°                        |
| 22          | 30.20                   | 36   | 28   | 32.0                                    | S. W.                    | 0                    |   |
| 23          | 30.12                   | 35   | 29   | 32.0                                    | N. W.                    | 0                    |   |
| 24          | 30.1                    | 35   | 29   | 32.0                                    | N. W.                    | 0                    |   |
| 25          | 30.02                   | 34   | 28   | 31.0                                    | N.                       | 1.45 S               |   |
| 26          | 30.05                   | 34   | 28   | 31.0                                    | N. E.                    | 0                    |   |
| 27          | 30.47                   | 36   | 30   | 33.0                                    | S. W.                    | 0                    |   |
| 28          | 30.36                   | 34   | 22   | 28.0                                    | S. W.                    | 0                    |   |
| Total Means |                         |      |      |   |                          |                      | 5.10 in   |

## REMARKS.

Total Snowfall, 18.92 inches.  
Snowfall, February, 1894, 26.25 inches.

Brilliant Aurora on 23d.  
Halo on 18th. Corona on 17th.

Average of 7 A. M. temperature 25.4°

Average of 2 P. M. temperature 31.2°

Average of 9 P. M. temperature 29.4°

Average temperature, based on these figures, 29.4°

Average of 7 A. M. barometer readings 30.16 inches.

Average of 2 P. M. barometer readings 30.13 inches.

Average of 9 P. M. barometer readings 30.18 inches.

Mean Temperature of 1893 February, 28.3°  
\* Rain and Melted Snow

Precipitation, February 1893, 5.04 in.

\* T indicates Trace of Precipitation  
S indicates Snow

# Meteorological Observations taken at Newark, N. J., March 1894.

By PROF. G. C. SONN, VOL. OBSERVER U. S. WEATHER BUREAU

| DATE        | Daily Mean<br>Barometer. | Temperature. |      |      | Daily Mean<br>Humidity | Prevailing<br>Direction<br>of Wind | Velocity<br>Miles per Hour<br>Maximum | Daily<br>Precipitation* | GENERAL ITEMS                                       |
|-------------|--------------------------|--------------|------|------|------------------------|------------------------------------|---------------------------------------|-------------------------|---|
|             |                          | Max          | Min  | Me'n |                        |                                    |                                       |                         |   |
| 2           | 30.164                   | 51           | 25   | 38.0 | 79 per C               | S. W.                              | 9                                     | 0.00 in.                | Mean Barometer, 30.171 inches                       |
| 3           | 30.167                   | 50           | 24   | 37.5 | 74                     | S. W.                              | 30                                    | 0                       | Highest Barometer, 30.173 inches 7 A. M. 28th       |
| 4           | 30.168                   | 49           | 23   | 36.5 | 74                     | W.                                 | 30                                    | 0                       | Lowest Barometer, 29.991 inches 5 P. M. 19th.       |
| 5           | 30.171                   | 51           | 26   | 38.5 | 79                     | S. W.                              | 15                                    | 0                       | Monthly Range of Barometer, 0.182 inches            |
| 6           | 30.120                   | 57           | 32   | 44.5 | 86                     | S. W.                              | 15                                    | 0                       | Mean Temperature, 43.7°                             |
| 7           | 30.192                   | 70           | 40   | 55.0 | 62                     | S. S. W.                           | 24                                    | 0                       | Highest Temperature, 70° on 6th                     |
| 8           | 30.097                   | 60           | 46   | 53.0 | 32                     | N. W.                              | 15                                    | 0.01                    | Lowest Temperature, 46° on 24th                     |
| 9           | 30.175                   | 48           | 32   | 40.5 | 65                     | N. N. E.                           | 10                                    | 0                       | Daily Range of Temperature, 16°                     |
| 10          | 30.162                   | 45           | 34   | 39.5 | 78                     | N. N. E.                           | 10                                    | 0.15                    | Greatest Daily Range of Temperature, 30° on 6th.    |
| 11          | 30.229                   | 51           | 38   | 44.5 | 80                     | N. N. E.                           | 10                                    | 0                       | Least Daily Range of Temperature, 6° on 29th        |
| 12          | 29.984                   | 52           | 39   | 45.5 | 90                     | Variable                           | 15                                    | 0.13                    | Mean Daily Range of Temperature, 8°                 |
| 13          | 29.977                   | 54           | 41   | 47.5 | 86                     | N. W.                              | 15                                    | 0                       | Total Precipitation, 1.94 inches.                   |
| 14          | 30.769                   | 60           | 34   | 42.0 | 68                     | S. E.                              | 20                                    | 0.02                    | Mean Daily Relative Humidity,                       |
| 15          | 30.871                   | 47           | 34   | 40.5 | 43                     | N. W.                              | 48                                    | 0                       | Prevailing Direction of Wind, S. W.                 |
| 16          | 30.106                   | 38           | 26   | 32.0 | 70                     | Variable                           | 10                                    | 0.23 S & R              | Number of Foggy Days,                               |
| 17          | 30.017                   | 55           | 31   | 43.5 | 62                     | S. W.                              | 30                                    | 0                       | Number of Clear Days,                               |
| 18          | 30.241                   | 57           | 32   | 44.5 | 63                     | S. E.                              | 15                                    | 0                       | Number of Fair Days, 14                             |
| 19          | 30.171                   | 65           | 36   | 50.5 | 78                     | S.                                 | 10                                    | 0.01                    | Number of Cloudy Days,                              |
| 20          | 30.036                   | 69           | 41   | 55.0 | 78                     | S. S. W.                           | 20                                    | 0.07                    | Total Number of Days on which Rain or Snow Fell, 12 |
| 21          | 30.311                   | 58           | 30   | 44.5 | 60                     | E.                                 | 12                                    | 0                       | Thunder Storms, 1                                   |
| 22          | 30.088                   | 50           | 40   | 45.0 | 87                     | N. E.                              | 12                                    | 0                       | Mean Max. Temperature, 58°                          |
| 23          | 29.967                   | 67           | 45   | 56.0 | 76                     | Variable                           | 30                                    | 0.55                    | Mean Min. Temperature, 32°                          |
| 24          | 30.777                   | 68           | 39   | 48.5 | 70                     | N. N. W.                           | 35                                    | 0.26                    | Snowfall, 3.8 in Feb.                               |
| 25          | 30.189                   | 48           | 32   | 40.0 | 65                     | E.                                 | 20                                    | 0                       |   |
| 26          | 29.917                   | 47           | 35   | 41.0 | 65                     | N. N. W.                           | 15                                    | 0.15                    |   |
| 27          | 30.069                   | 36           | 26   | 31.0 | 69                     | N. W.                              | 35                                    | 0                       |   |
| 28          | 30.128                   | 35           | 19   | 27.0 | 56                     | N. W.                              | 30                                    | 0                       |   |
| 29          | 30.497                   | 42           | 23   | 32.5 | 53                     | S.                                 | 24                                    | 0                       |   |
| 30          | 30.048                   | 70           | 38   | 54.0 | 87                     | S. S. W.                           | 35                                    | 0.18                    |   |
| 31          | 30.105                   | 51           | 31   | 41.0 | 48                     | W. S. W.                           | 24                                    | 0                       |   |
| 32          | 29.999                   | 62           | 33   | 47.5 | 63                     | S.                                 | 30                                    | 0                       |   |
| Total Means | 30.111                   | 52.6         | 34.7 | 43.7 | 67 per C               |                                    |                                       | 1.94 in.                |   |

## REMARKS.

Solar halo with the sun dogs, and three distinct Cows, one being inverted on 28th, 5 P. M.  
Aurora, brilliant, on 30th  
Lunar halo 14th, corona 14th-15th

Killing frosts, numerous toward end of the month.  
Barometer average, 7 A. M., 30.147  
Barometer average, 2 P. M., 30.074  
Barometer average, 9 P. M., 30.12

General Summary. The month was the warmest March ever recorded in Newark, and records go back fifty years. There was no snowfall, and this has occurred but twice before in the same time.

Average Temperature for 2 years previous, 45°  
\* Rain and Melted Snow

Average Precipitation for 2 years previous, 3.97 inches

\* T indicates Trace of Precipitation.

# Meteorological Observations taken at Newark, N. J., April 1894.

By PROF. G. C. SONN, VOL. OBSERVER, U. S. WEATHER BUREAU.

| DATE.       | Daily Mean<br>Barometer | Temperature. |       |      | Daily Mean<br>Humidity | Prevailing<br>Direction<br>of Wind | Velocity<br>Miles per Hour.<br>Maximum | Daily<br>Precipitation* | GENERAL ITEMS.                                     |
|-------------|-------------------------|--------------|-------|------|------------------------|------------------------------------|--|-------------------------|--|
|             |                         | Max.         | M. n. | Min. |                        |                                    |  |                         |  |
| 1           | 29.81                   | 63           | 45    | 56.0 | 51 per C               | S. W.                              | 25                                     | 0.00 in.                | Mean Barometer 30.06 inches.                       |
| 2           | 30.09                   | 48           | 34    | 41.1 | 48                     | N. N. W.                           | 30                                     | 0.00                    | Highest Barometer 30.83 inches on 30th             |
| 3           | 30.37                   | 44           | 24    | 34.6 | 61                     | S. S. E.                           | 24                                     | 0.00                    | Lowest Barometer, 29.568 inches on 11th            |
| 4           | 29.95                   | 63           | 33    | 43.3 | 87                     | S. S. W.                           | 29                                     | 1.28                    | Monthly Range of Barometer 91.26 inches            |
| 5           | 29.55                   | 58           | 43    | 50.5 | 68                     | W.                                 | 40                                     | 0.00                    | Mean Temperature, 4                                |
| 6           | 30.09                   | 49           | 37    | 43.0 | 54                     | W. N. W.                           | 49                                     | 0.00                    | Highest Temperature 8° on 17th                     |
| 7           | 30.17                   | 42           | 31    | 36.5 | 64                     | Variable                           | 15                                     | 0.10 R & S              | Lowest Temperature 24.8° on 41                     |
| 8           | 30.12                   | 43           | 33    | 38.0 | 76                     | N. N. W.                           | 30                                     | 1.65                    | Monthly Range of Temperature 54°                   |
| 9           | 30.29                   | 52           | 30    | 41.1 | 49                     | N. N. E.                           | 30                                     | 0.00                    | Greatest Daily Range of Temperature, 32° on 16th   |
| 10          | 30.12                   | 42           | 33    | 37.5 | 75                     | N. N. E.                           | 24                                     | 0.50                    | Least Daily Range of Temperature, 8° on 11th       |
| 11          | 29.62                   | 46           | 32    | 34.9 | 88                     | N. N. E.                           | 40                                     | 0.54 R & S              | Mean Daily Range of Temperature 18°                |
| 12          | 29.37                   | 40           | 32    | 36.3 | 70                     | N. N. E.                           | 20                                     | 0.07 R & S              | Total Precipitation, 4.62 inches                   |
| 13          | 29.20                   | 57           | 47    | 47.3 | 63                     | S. N. W.                           | 30                                     | 0.00                    | Mean Daily Relative Humidity 50 per cent           |
| 14          | 29.62                   | 50           | 37    | 48.5 | 55                     | N. W.                              | 20                                     | 0.00                    | Prevailing Direction of Wind, N. W.                |
| 15          | 31.06                   | 63           | 37    | 50.3 | 59                     | N.                                 | 15                                     | 0.00                    | Number of Foggy Days, 2                            |
| 16          | 30.10                   | 70           | 38    | 54.1 | 51                     | Variable                           | 15                                     | 0.00                    | Number of Clear Days, 1                            |
| 17          | 30.19                   | 60           | 44    | 52.3 | 47                     | S. E.                              | 20                                     | 0.00                    | Number of Fair Days, 8                             |
| 18          | 30.29                   | 63           | 38    | 50.5 | 65                     | S. E.                              | 20                                     | 0.00                    | Number of Cloudy Days, 8                           |
| 19          | 30.13                   | 64           | 46    | 55.0 | 79                     | S. E.                              | 19                                     | 0.00                    | Total Number of Days on which Rain or Snow Fell 10 |
| 20          | 29.96                   | 61           | 50    | 55.5 | 89                     | S. E.                              | 15                                     | 0.13                    | Thunder Storm 20°                                  |
| 21          | 29.81                   | 71           | 53    | 62.0 | 74                     | S. E.                              | 20                                     | 0.08                    | Mean Maximum Temperature, 58.1°                    |
| 22          | 29.81                   | 62           | 46    | 54.0 | 77                     | W. E. W.                           | 15                                     | 0.24                    | Mean Minimum Temperature 40°                       |
| 23          | 30.00                   | 63           | 41    | 52.0 | 65                     | W.                                 | 24                                     | 0.00                    |  |
| 24          | 29.96                   | 60           | 46    | 53.0 | 61                     | N. W.                              | 20                                     | 0.00                    |  |
| 25          | 30.15                   | 66           | 46    | 57.0 | 58                     | N. W.                              | 15                                     | 0.00                    |  |
| 26          | 30.13                   | 74           | 44    | 59.0 | 48                     | S. W.                              | 20                                     | 0.00                    |  |
| 27          | 30.02                   | 72           | 50    | 64.0 | 54                     | S. W.                              | 15                                     | 0.00                    |  |
| 28          | 29.93                   | 72           | 56    | 64.0 | 75                     | S. W.                              | 15                                     | 0.00                    |  |
| 29          | 30.27                   | 65           | 48    | 56.5 | 57                     | S. E.                              | 24                                     | 0.00                    |  |
| 30          | 30.40                   | 64           | 41    | 52.5 | 60                     | S. S. E.                           | 24                                     | 0.00                    |  |
| Total Means | 30.05                   | 58.1         | 49.1  | 49.1 | 66 per C               |                                    |  | 2.62 in.                |  |

## REMARKS.

No hard frosts as late as the 5th  
Last snow storm on 27th  
2.25 in. snow on 11th  
Total snow of the month, 2.50 in  
Ice  $\frac{1}{4}$  in. thick on 9th  
Lunar Ecl. on 8th.

Mean of 7 A. M., temperature 44.5°  
Mean of 7 A. M., barometer, 30.5 in.  
Mean of 2 A. M., temperature, 56.7°  
Mean of 2 P. M., barometer, 30.03 in.  
Mean of 9 P. M., temperature, 48.1°  
Mean of 9 P. M., barometer, 30.06 in.

Highest temperature on record for April, in Newark,  
official 85.5° in 1846.  
Lowest temperature on record for April, in Newark,  
official 15°, 1857.

Average Temperature for 3 years 49°  
\* Rain and Melted Snow.

Average Precipitation for 3 years 3.33 inches

\* T indicates Trace of Precipitation  
\* S indicates Snow

Meteorological Observations taken at Newark, N. J., May 1894.

BY PROTESTANT SONN-ABOBSERVER, I. S. WILSON: BUREAU.

| DATE        | Barometer | Temperature |      |      | Daily Mean | Prevailing Direction of Wind | Velocity Miles per Hour | Daily Precipitation* | GENERAL ITEMS                                   |
|-------------|-----------|-------------|------|------|------------|------------------------------|-------------------------|----------------------|---|
|             |           | Max         | Min  | Mean |            |                              |                         |                      |   |
| 1           | 29.86     | 84          | 71   | 77   | per C      | S W                          | 5                       | 00                   | Mean Barometer 29.96 inches on 21st             |
| 2           | 29.82     | 88          | 70   | 79   | per C      | S W                          | 24                      | 00                   | Highest Barometer, 29.84 inches on 4th and 25th |
| 3           | 29.84     | 84          | 69   | 76   | per C      | S W                          | 24                      | 00                   | Lowest Barometer, 29.61 inches                  |
| 4           | 29.87     | 90          | 68   | 79   | per C      | S W                          | 5                       | 00                   | Monthly Range of Barometer, .86 inches.         |
| 5           | 29.84     | 88          | 68   | 78   | per C      | S W                          | 5                       | 00                   | Mean Rain, 1.40 inches                          |
| 6           | 29.83     | 85          | 70   | 77   | per C      | S W                          | 4                       | 00                   | Mean Daily Rain, .07 inches                     |
| 7           | 29.80     | 85          | 69   | 77   | per C      | S W                          | 2                       | 00                   | Mean Daily Snow, .00 inches                     |
| 8           | 29.81     | 85          | 71   | 78   | per C      | S W                          | 4                       | 00                   | Mean Daily Sleet, .00 inches                    |
| 9           | 29.82     | 85          | 71   | 78   | per C      | S W                          | 5                       | 00                   | Mean Daily Fog, .00 inches                      |
| 10          | 29.82     | 85          | 71   | 78   | per C      | S W                          | 0                       | 00                   | Mean Daily Clouds, 100 per cent                 |
| 11          | 29.83     | 85          | 71   | 78   | per C      | S W                          | 0                       | 00                   | Mean Daily Relative Humidity, 76 per cent       |
| 12          | 29.83     | 85          | 71   | 78   | per C      | S W                          | 0                       | 00                   | Mean Daily Relative Humidity, 76 per cent       |
| 13          | 29.83     | 85          | 71   | 78   | per C      | S W                          | 0                       | 00                   | Mean Daily Relative Humidity, 76 per cent       |
| 14          | 29.83     | 85          | 71   | 78   | per C      | S W                          | 0                       | 00                   | Mean Daily Relative Humidity, 76 per cent       |
| 15          | 29.83     | 85          | 71   | 78   | per C      | S W                          | 0                       | 00                   | Mean Daily Relative Humidity, 76 per cent       |
| 16          | 29.83     | 85          | 71   | 78   | per C      | S W                          | 0                       | 00                   | Mean Daily Relative Humidity, 76 per cent       |
| 17          | 29.83     | 85          | 71   | 78   | per C      | S W                          | 0                       | 00                   | Mean Daily Relative Humidity, 76 per cent       |
| 18          | 29.83     | 85          | 71   | 78   | per C      | S W                          | 0                       | 00                   | Mean Daily Relative Humidity, 76 per cent       |
| 19          | 29.83     | 85          | 71   | 78   | per C      | S W                          | 0                       | 00                   | Mean Daily Relative Humidity, 76 per cent       |
| 20          | 29.83     | 85          | 71   | 78   | per C      | S W                          | 0                       | 00                   | Mean Daily Relative Humidity, 76 per cent       |
| 21          | 29.83     | 85          | 71   | 78   | per C      | S W                          | 0                       | 00                   | Mean Daily Relative Humidity, 76 per cent       |
| 22          | 29.83     | 85          | 71   | 78   | per C      | S W                          | 0                       | 00                   | Mean Daily Relative Humidity, 76 per cent       |
| 23          | 29.83     | 85          | 71   | 78   | per C      | S W                          | 0                       | 00                   | Mean Daily Relative Humidity, 76 per cent       |
| 24          | 29.83     | 85          | 71   | 78   | per C      | S W                          | 0                       | 00                   | Mean Daily Relative Humidity, 76 per cent       |
| 25          | 29.83     | 85          | 71   | 78   | per C      | S W                          | 0                       | 00                   | Mean Daily Relative Humidity, 76 per cent       |
| 26          | 29.83     | 85          | 71   | 78   | per C      | S W                          | 0                       | 00                   | Mean Daily Relative Humidity, 76 per cent       |
| 27          | 29.83     | 85          | 71   | 78   | per C      | S W                          | 0                       | 00                   | Mean Daily Relative Humidity, 76 per cent       |
| 28          | 29.83     | 85          | 71   | 78   | per C      | S W                          | 0                       | 00                   | Mean Daily Relative Humidity, 76 per cent       |
| 29          | 29.83     | 85          | 71   | 78   | per C      | S W                          | 0                       | 00                   | Mean Daily Relative Humidity, 76 per cent       |
| 30          | 29.83     | 85          | 71   | 78   | per C      | S W                          | 0                       | 00                   | Mean Daily Relative Humidity, 76 per cent       |
| Total Means | 29.85     | 85.4        | 71.6 | 78.5 | per C      | S W                          | 0                       | 00                   | Mean Daily Relative Humidity, 76 per cent       |

\* Rain and Melted Snow

Average stress index for 3 responses = 0.15

$$* \Gamma = \{ \Gamma_1, \Gamma_2, \dots, \Gamma_n \} \text{ is a family of } n \text{ disjoint } \Gamma \text{ sets.}$$

# Meteorological Observations taken at Newark, N. J., June 1894.

By PROF. G. C. SONN VOL. OBSERVER, U. S. WEATHER BUREAU

| DATE.       | Daily Mean Temperature |                | Daily Mean Humidity |  | Prevailing Direction of Wind. | Velocity Miles per Hour Maximum | Daily Precipitation* | GENERAL ITEMS                                      |
|-------------|------------------------|----------------|---------------------|--|-------------------------------|---------------------------------|----------------------|--|
|             | Barometer.             | Max. Min. Me'n | Humidity            |  |                               |                                 |                      |  |
| 1           | 29.70                  | 63 48 56       | 63 per C            |  | S. W.                         | 24                              | 0.04 in.             | Mean Barometer, 30.00 inches.                      |
| 2           | 29.67                  | 71 46 61       | 76                  |  | S. W.                         | 24                              | 0.37                 | Highest Barometer, 30.33 inches on 14th            |
| 3           | 29.74                  | 75 52 64       | 62                  |  | W. S. W.                      | 15                              | 0.06                 | Lowest Barometer, 29.64 inches on 2d.              |
| 4           | 29.72                  | 80 57 69       | 68                  |  | W. S. W.                      | 20                              | 0.16                 | Monthly Range of Barometer, 0.69 inches.           |
| 5           | 29.85                  | 87 54 59       | 1                   |  | N. W.                         | 12                              | 0.06                 | Mean Temperature, 58°                              |
| 6           | 29.84                  | 90 49 54       | 81                  |  | S. S. W.                      | 20                              | 0.20                 | Highest Temperature, 90° on 6th.                   |
| 7           | 29.84                  | 77 47 57       | 58                  |  | N. W.                         | 20                              | 0.00                 | Lowest Temperature, 47° on 7th.                    |
| 8           | 30.00                  | 73 46 61       | 53                  |  | S. W.                         | 10                              | 0.00                 | Monthly Range of Temperature, 49°                  |
| 9           | 30.08                  | 79 55 67       | 71                  |  | S. W.                         | 15                              | 0.00                 | Greatest Daily Range of Temperature, 24° on 9th.   |
| 10          | 30.17                  | 85 58 71       | 55                  |  | W.                            | 10                              | 0.30                 | Least Daily Range of Temperature, 17° on 10th.     |
| 11          | 30.17                  | 92 67 80       | 55                  |  | S. W.                         | 10                              | 0.40                 | Monthly Range of Temperature, 45°                  |
| 12          | 30.06                  | 83 68 76       | 69                  |  | W.                            | 12                              | 0.00                 | Total Precipitation, 1.51 in.                      |
| 13          | 30.19                  | 71 60 66       | 74                  |  | E.                            | 12                              | 0.00                 | Mean Daily Relative Humidity, 69 per cent.         |
| 14          | 30.27                  | 74 52 65       | 55                  |  | V. variable                   | 12                              | 0.00                 | Prevailing Direction of Wind, S. W.                |
| 15          | 30.15                  | 84 53 69       | 57                  |  | S. W.                         | 24                              | 0.00                 | Number of Foggy Days, 0                            |
| 16          | 29.98                  | 89 60 75       | 67                  |  | S. W.                         | 24                              | 0.00                 | Number of Clear Days, 13                           |
| 17          | 29.65                  | 90 68 79       | 66                  |  | S. S.                         | 1                               | 0.00                 | Number of Fair Days, 5                             |
| 18          | 30.00                  | 88 71 79       | 7                   |  | E. S. E.                      | 12                              | 0.00                 | Number of Cloudy Days, 9                           |
| 19          | 30.05                  | 87 71 79       | 28                  |  | S. S. W.                      | 24                              | 0.43                 | Total Number of Days on which Rain or Snow Fell, 9 |
| 20          | 30.06                  | 83 65 76       | 47                  |  | S. W.                         | 15                              | 0.00                 | Thunder Storm, 14th, two on 19th, 30th.            |
| 21          | 30.03                  | 85 67 76       | 65                  |  | W. S. W.                      | 15                              | 0.00                 | Mean Max. Temperature, 81°                         |
| 22          | 30.04                  | 85 68 76       | 61                  |  | S. W.                         | 15                              | 0.00                 | Mean Min. Temperature, 51°                         |
| 23          | 30.01                  | 86 70 83       | 55                  |  | W. S. W.                      | 15                              | 0.00                 |  |
| 24          | 30.16                  | 86 62 74       | 72                  |  | S. E.                         | 20                              | 0.12                 |  |
| 25          | 30.14                  | 82 50 66       | 86                  |  | E. S. E.                      | 1                               | 0.00                 |  |
| 26          | 29.98                  | 86 67 77       | 80                  |  | E. S. E.                      | 15                              | 0.30                 |  |
| 27          | 29.99                  | 88 72 80       | 68                  |  | S. S. W.                      | 15                              | 0.00                 |  |
| 28          | 30.00                  | 86 68 77       | 57                  |  | N. W.                         | 12                              | 0.00                 |  |
| 29          | 30.37                  | 88 69 74       | 82                  |  | S. E.                         | 18                              | 0.00                 |  |
| 30          | 30.35                  | 87 69 78       | 73                  |  | S. W.                         | 20                              | 0.08                 |  |
| Total Means | 30.00                  | 80.6 60.6 70.9 | 69 per C            |  |                               |                                 | 1.51 in.             |  |

Average Mean Temperature for 3 years preceding, 61°.

\* Rain and Melted Snow.

Average Rainfall for 2 years preceding, 3.76 in.

\* T. indicates Trace of Precipitation.

## REMARKS.

Lunar corona, 12th.  
Double Rainbow, etc.



# Meteorological Observations taken at Newark, N. J., July 1894.

By PROF. G. C. SONN, VOL. OBSERVER, U. S. WEATHER BUREAU

| DATE        | Daily Mean<br>Barometer | Temperature |      |      | Daily Mean<br>Humidity | Prevailing<br>Direction<br>of Wind | Velocity<br>Miles per Hour<br>Maximum | Daily<br>Precipitation | GENERAL ITEMS                                      |
|-------------|-------------------------|-------------|------|------|------------------------|------------------------------------|---------------------------------------|------------------------|--|
|             |                         | Max         | Min  | Mean |                        |                                    |                                       |                        |  |
| 1           | 29.93                   | 73          | 67   | 80.3 | 74 per cent            | S. W.                              | 12                                    | 0.00 in.               | Mean Barometer 30.00 inches                        |
| 2           | 29.96                   | 88          | 81   | 92.5 | 77                     | S. W.                              | 8                                     | 0                      | Highest Barometer 30.23 inches                     |
| 3           | 29.88                   | 85          | 81   | 89.7 | 76                     | S. W.                              | 7                                     | 0                      | Lowest Barometer 29.74 inches                      |
| 4           | 29.89                   | 89          | 80   | 92.0 | 75                     | S. W.                              | 4                                     | 0.00                   | Daily Range of Barometer .58 inches                |
| 5           | 29.94                   | 82          | 80   | 93.0 | 75                     | W. S. W.                           | 15                                    | 0.00                   | Mean Precipitation .00                             |
| 6           | 29.83                   | 82          | 66   | 89.5 | 87                     | S. S. E.                           | 15                                    | 0.00                   | Highest Temperature 98° on 28th and 29th           |
| 7           | 29.96                   | 78          | 62   |      |                        | W.                                 | 7                                     | 0.00                   | Lowest Temperature 54° on 1st                      |
| 8           | 30.07                   | 79          | 59   | 80   | 78                     | W.                                 | 9                                     | 0.00                   | Daily Range of Temperature 25°                     |
| 9           | 30.05                   | 73          | 58   | 80.3 | 78                     | Variable                           |                                       | 0.00                   | Greatest Daily Range of Temperature 25° on 28th    |
| 10          | 30.03                   | 73          | 63   | 80.3 | 78                     | S. W.                              | 10                                    | 0.00                   | Lowest Daily Range of Temperature 5° on 28th       |
| 11          | 30.05                   | 88          | 69   | 79.1 | 71                     | W. S. W.                           | 1                                     | 0.00                   | Mean Daily Range of Temperature 19.4°              |
| 12          | 29.97                   | 87          | 67   | 81   | 67                     | S. W.                              | 12                                    | 0.00                   | Total Precipitation .25 in.                        |
| 13          | 29.88                   | 90          | 72   | 81   | 69                     | S. W.                              | 9                                     | 0.00                   | Mean Daily Relative Humidity                       |
| 14          | 29.96                   | 90          | 72   | 81   | 69                     | S. W.                              | 9                                     | 0.00                   | Prevailing Direction of Wind S. W.                 |
| 15          | 30.04                   | 85          | 68   | 79.3 | 68                     | S. S. W.                           | 5                                     | 0.00                   | Number of Foggy Days 0                             |
| 16          | 30.10                   | 85          | 69   | 72.5 | 82                     | N. W.                              | 1                                     | 0.00                   | Number of Clear Days 3                             |
| 17          | 30.17                   | 85          | 63   | 74.3 | 72                     | E. S. E.                           | 15                                    | 0.00                   | Number of Fair Days 15                             |
| 18          | 30.15                   | 83          | 66   | 74.5 | 71                     | S. W.                              | 9                                     | 0.00                   | Number of Cloudy Days 0                            |
| 19          | 30.12                   | 95          | 68   | 81.5 | 66                     | S. W.                              | 15                                    | 0.00                   | Total Number of Days on which Rain or Snow Fell 11 |
| 20          | 29.86                   | 87          | 71   | 83.7 | 67                     | S. W.                              | 5                                     | 0.00                   | Thunder Storms 6, 14, 20, 26, 29 and 31            |
| 21          | 29.78                   | 90          | 71   | 82.0 | 83                     | S. W.                              | 9                                     | 0.00                   | Mean Max. Temperature 84°                          |
| 22          | 30.00                   | 68          | 62   | 74.0 | 84                     | S. N. E.                           | 20                                    | 0.00                   | Mean Min. Temperature 64.4°                        |
| 23          | 30.04                   | 73          | 63   | 78.0 | 80                     | S. N. E.                           | 21                                    | 0.00                   |  |
| 24          | 29.99                   | 83          | 67   | 79.0 | 75                     | S. W.                              | 4                                     | 0.00                   |  |
| 25          | 30.09                   | 92          | 65   | 79.5 | 62                     | S. W.                              | 4                                     | 0.00                   |  |
| 26          | 30.02                   | 93          | 71   | 82.0 | 69                     | Variable                           | 12                                    | 0.00                   |  |
| 27          | 30.03                   | 90          | 70   | 80.0 | 76                     | S. S. E.                           | 2                                     | 0.00                   |  |
| 28          | 30.14                   | 98          | 74   | 84.5 | 68                     | S. W.                              | 5                                     | 0.00                   |  |
| 29          | 30.05                   | 98          | 77   | 85.0 | 60                     | S. W.                              | 25                                    | 0.00                   |  |
| 30          | 30.03                   | 91          | 77   | 84.0 | 53                     | W. S. W.                           | 24                                    | 0.00                   |  |
| 31          | 30.01                   | 89          | 71   | 80.0 | 74                     | S. W.                              | 15                                    | 0.00                   |  |
| Total Means | 30.01                   | 86.1        | 66.4 | 78.2 | 67 per cent            |                                    |                                       | 2.60 in.               |  |

## REMARKS.

Shooting stars in quantity, 25th and 26th

The average temperature of the month was 74.5° above normal making it probably the hottest July on record. The rainfall was almost two inches below average July being usually a wet month.

The Maximum Temperature on record for July is 98.4°, it occurred in 1890.

The Maximum Temperature for July 1893 was 96.4° The Minimum Temperature for July 1893 was 54°.

\* T Indicates Trace of Precipitation.

\* Rain and Melted Snow

# Meteorological Observations taken at Newark, N. J., August 1894.

BY PROF. G. C. SONN, VOL. OBSERVER, U. S. WEATHER BUREAU

| DATE.           | Daily Mean<br>Barometer | Temperature. |     |      | Daily Mean<br>Humidity | Prevailing<br>Direction<br>of Wind | Velocity<br>Miles per Hour<br>Maximum | Daily<br>Precipitation* | GENERAL ITEMS  |
|-----------------|-------------------------|--------------|-----|------|------------------------|------------------------------------|---------------------------------------|-------------------------|--|
|                 |                         | Max          | Min | Mean |                        |                                    |                                       |                         |  |
| 1               | 30.30                   | 85           | 65  | 75.0 | 2 per C                | N. W.                              | 2                                     | 0.00 in.                | Mean Barometer 30.030 inches   |
| 2               | 29.90                   | 84           | 71  | 78.0 | 84                     | S. E.                              | 24                                    | 0.00                    | Highest Barometer 30.221 inches  |
| 3               | 29.84                   | 85           | 69  | 77.0 | 8                      | W. N. W.                           | 10                                    | 0.00                    | Lowest Barometer 29.799 inches   |
| 4               | 30.36                   | 78           | 60  | 69.0 | 73                     | N. W.                              | 10                                    | 0.00                    | Monthly Range of Barometer, 0.422 inches.  |
| 5               | 30.12                   | 79           | 61  | 70.0 | 7                      | W. S. W.                           | 10                                    | 0.00                    | Mean Temperature 71.9°   |
| 6               | 30.16                   | 84           | 57  | 70.5 | 7                      | S.                                 | 7                                     | 0.00                    | Highest Temperature 9° on 24th.  |
| 7               | 30.18                   | 88           | 61  | 75.0 | 92                     | S. W.                              | 7                                     | 0.00                    | Lowest Temperature 58° on 24th.  |
| 8               | 29.97                   | 90           | 54  | 72.5 | 71                     | S. W.                              | 6                                     | 0.00                    | Monthly Range of Temperature, 48°  |
| 9               | 30.22                   | 91           | 53  | 72.0 | 65                     | W.                                 | 8                                     | 0.00                    | Greatest Daily Range of Temperature, 33° on 23d  |
| 10              | 30.30                   | 86           | 57  | 71.5 | 60                     | N.                                 | 8                                     | 0.00                    | Least Daily Range of Temperature, 12° on 26th  |
| 11              | 30.15                   | 80           | 51  | 65.5 | 53                     | N.                                 | 7                                     | 0.00                    | Mean Daily Range of Temperature,   |
| 12              | 30.00                   | 80           | 58  | 69.0 | 70                     | N. W.                              | 7                                     | 0.00                    | Total Precipitation 2.56 in.   |
| 13              | 30.28                   | 73           | 61  | 68.0 | 62                     | N. W.                              | 6                                     | 0.00                    | Mean Daily Relative Humidity   |
| 14              | 30.00                   | 80           | 60  | 70.0 | 82                     | E.                                 | 6                                     | 0.00                    | Prevailing Direction of Wind, W. S. W.   |
| 15              | 29.90                   | 83           | 60  | 71.5 | 81                     | S. S. W.                           | 30                                    | 0.25                    | Number of Foggy Days, 0  |
| 16              | 29.88                   | 80           | 60  | 70.0 | 71                     | S. N. W.                           | 15                                    | 0.00                    | Number of Clear Days, 11   |
| 17              | 30.35                   | 82           | 58  | 70.0 | 62                     | Variable                           | 10                                    | 0.00                    | Number of Fair Days, 12  |
| 18              | 30.00                   | 82           | 60  | 71.0 | 8                      | W. S. W.                           | 12                                    | 0.00                    | Number of Cloudy Days, 8   |
| 19              | 29.95                   | 90           | 68  | 79.0 | 68                     | S. S. E.                           | 9                                     | 0.00                    | Total Number of Days on which Rain or Snow Fell, 7   |
| 20              | 29.90                   | 78           | 54  | 66.0 | 80                     | N. W.                              | 12                                    | 0.48                    | Thunder Storm, 8, 12, and 15.  |
| 21              | 30.00                   | 74           | 65  | 69.5 | 84                     | N. W.                              | 20                                    | 0.00                    | Mean Max. Temperature, 82.2°   |
| 22              | 30.12                   | 80           | 53  | 66.5 | 85                     | W. S. W.                           | 3                                     | 0.00                    | Mean Min. Temperature, 61.5°   |
| 23              | 30.17                   | 80           | 57  | 68.5 | 72                     | S. S. W.                           | 15                                    | 0.00                    |  |
| 24              | 30.12                   | 80           | 52  | 66.0 | 71                     | S. W.                              | 12                                    | 0.00                    |  |
| 25              | 30.14                   | 80           | 53  | 66.5 | 71                     | S. W.                              | 1                                     | 0.00                    |  |
| 26              | 30.10                   | 80           | 58  | 69.0 | 70                     | N. W.                              | 15                                    | 0.00                    |  |
| 27              | 30.02                   | 81           | 58  | 70.0 | 78                     | S. W.                              | 12                                    | 0.00                    |  |
| 28              | 30.05                   | 79           | 59  | 69.0 | 71                     | N. W.                              | 12                                    | 0.00                    |  |
| 29              | 29.91                   | 83           | 61  | 72.0 | 60                     | S. W.                              | 20                                    | 0.00                    |  |
| 30              | 30.08                   | 79           | 59  | 69.0 | 62                     | W. S. W.                           | 12                                    | 0.00                    |  |
| 31              |                         |              |     |      |                        |                                    |                                       |                         |  |
| <b>REMARKS.</b> |                         |              |     |      |                        |                                    |                                       |                         |  |
| Total Means     |                         |              |     |      |                        |                                    |                                       |                         | The rainfall of July was 2.5 inches, of which 1.6 came in one shower on the 6th  |
|                 |                         |              |     |      |                        |                                    |                                       |                         | June also was a dry month. The drought became marked in August. The country round about has not suffered so much since the phenomenal drought of 1881. |
|                 |                         |              |     |      |                        |                                    |                                       |                         | August, 1893, gave rainfall of   |

Average Temperature for two previous years of 63.3.  
\* Rain and Melted Snow

Average Precipitation for two years previous 5.73 in.

\* T indicates Trace of Precipitation

# Meteorological Observations taken at Newark, N. J., September 1894.

By PROF. G. C. SONN, VOL. OBSERVER, U. S. WEATHER BUREAU

| DATE          | Daily Mean<br>Barometer | Temperature |      |      | Daily Mean<br>Humidity | Prevailing<br>Direction<br>of Wind | Velocity<br>Miles per Hour<br>Maximum | Daily<br>Precipitation | GENERAL ITEMS                                   |
|---------------|-------------------------|-------------|------|------|------------------------|------------------------------------|---------------------------------------|------------------------|---|
|               |                         | Max         | Min  | Mean |                        |                                    |                                       |                        |   |
| 1             | 30.16                   | 82          | 56   | 69.0 | 62 per C               | S. W.                              |                                       | 0.00 in.               | Mean Barometer 30.11 inches.                    |
| 2             | 30.09                   | 89          | 69   | 74.0 | 56                     | S. W.                              |                                       | 0.00                   | Highest Barometer, 30.54 inches on 13th.        |
| 3             | 30.27                   | 77          | 44   | 60.5 | 71                     | N.                                 |                                       | 0.00                   | Lowest Barometer, 29.64 inches.                 |
| 4             | 30.24                   | 74          | 44   | 59.0 | 74                     | N.                                 |                                       | 0.00                   | 3 ft. 3 in. depth of barometer, 0.9 in. per ft. |
| 5             | 30.24                   | 74          | 44   | 59.0 | 74                     | N.                                 |                                       | 0.00                   | Mean Temperature, 62.2°                         |
| 6             | 30.11                   | 67          | 70.0 | 68.5 | 81                     | S. W.                              | 12                                    | 0.02                   | Highest Temperature, 94° on 16th.               |
| 7             | 30.11                   | 67          | 70.0 | 68.5 | 81                     | S. W.                              | 12                                    | 0.00                   | Lowest Temperature, 42° on 26th.                |
| 8             | 30.15                   | 65          | 70.0 | 67.5 | 95                     | S. W.                              | 12                                    | 0.94                   | Month's highest temperature.                    |
| 9             | 30.15                   | 67          | 76.0 | 71.5 | 81                     | W. S. W.                           | 12                                    | T                      | Month's lowest temperature, 42° on 26th.        |
| 10            | 30.15                   | 67          | 76.0 | 71.5 | 81                     | W. S. W.                           | 12                                    | T                      | Least favorable temperature, 42° on 26th.       |
| 11            | 30.15                   | 67          | 76.0 | 71.5 | 81                     | W. S. W.                           | 12                                    | T                      | Least favorable temperature, 42° on 26th.       |
| 12            | 30.15                   | 67          | 76.0 | 71.5 | 81                     | W. S. W.                           | 12                                    | T                      | Least favorable temperature, 42° on 26th.       |
| 13            | 30.15                   | 67          | 76.0 | 71.5 | 81                     | W. S. W.                           | 12                                    | T                      | Least favorable temperature, 42° on 26th.       |
| 14            | 30.15                   | 67          | 76.0 | 71.5 | 81                     | W. S. W.                           | 12                                    | T                      | Least favorable temperature, 42° on 26th.       |
| 15            | 30.15                   | 67          | 76.0 | 71.5 | 81                     | W. S. W.                           | 12                                    | T                      | Least favorable temperature, 42° on 26th.       |
| 16            | 30.15                   | 67          | 76.0 | 71.5 | 81                     | W. S. W.                           | 12                                    | T                      | Least favorable temperature, 42° on 26th.       |
| 17            | 30.15                   | 67          | 76.0 | 71.5 | 81                     | W. S. W.                           | 12                                    | T                      | Least favorable temperature, 42° on 26th.       |
| 18            | 30.15                   | 67          | 76.0 | 71.5 | 81                     | W. S. W.                           | 12                                    | T                      | Least favorable temperature, 42° on 26th.       |
| 19            | 30.15                   | 67          | 76.0 | 71.5 | 81                     | W. S. W.                           | 12                                    | T                      | Least favorable temperature, 42° on 26th.       |
| 20            | 30.15                   | 67          | 76.0 | 71.5 | 81                     | W. S. W.                           | 12                                    | T                      | Least favorable temperature, 42° on 26th.       |
| 21            | 30.15                   | 67          | 76.0 | 71.5 | 81                     | W. S. W.                           | 12                                    | T                      | Least favorable temperature, 42° on 26th.       |
| 22            | 30.15                   | 67          | 76.0 | 71.5 | 81                     | W. S. W.                           | 12                                    | T                      | Least favorable temperature, 42° on 26th.       |
| 23            | 30.15                   | 67          | 76.0 | 71.5 | 81                     | W. S. W.                           | 12                                    | T                      | Least favorable temperature, 42° on 26th.       |
| 24            | 30.15                   | 67          | 76.0 | 71.5 | 81                     | W. S. W.                           | 12                                    | T                      | Least favorable temperature, 42° on 26th.       |
| 25            | 30.15                   | 67          | 76.0 | 71.5 | 81                     | W. S. W.                           | 12                                    | T                      | Least favorable temperature, 42° on 26th.       |
| 26            | 30.15                   | 67          | 76.0 | 71.5 | 81                     | W. S. W.                           | 12                                    | T                      | Least favorable temperature, 42° on 26th.       |
| 27            | 30.15                   | 67          | 76.0 | 71.5 | 81                     | W. S. W.                           | 12                                    | T                      | Least favorable temperature, 42° on 26th.       |
| 28            | 30.15                   | 67          | 76.0 | 71.5 | 81                     | W. S. W.                           | 12                                    | T                      | Least favorable temperature, 42° on 26th.       |
| 29            | 30.15                   | 67          | 76.0 | 71.5 | 81                     | W. S. W.                           | 12                                    | T                      | Least favorable temperature, 42° on 26th.       |
| 30            | 30.15                   | 67          | 76.0 | 71.5 | 81                     | W. S. W.                           | 12                                    | T                      | Least favorable temperature, 42° on 26th.       |
| Total Average | 30.1                    | 70.4        | 50   | 60.5 | 74.4                   |                                    |                                       |                        |   |

Average Temperature for two previous years of  
Rain and Melted Snow

Average precipitation for two years previous

Number of Days of Precipitation

## REMARKS.

Maximum on 16th.

September of 1892, gave Mean Temperature 64.8 degrees  
Maximum 87 degrees, Minimum 44 degrees. Precipitation 2.5.

September of 1893, gave Mean Temperature 71 degrees,  
Maximum 83 degrees, Minimum 43 degrees. Precipitation 2.5.

# Meteorological Observations taken at Newark, N. J., October 1894.

By PROF. G. C. SONN, VOL. OBSERVER U. S. WEATHER BUREAU

| Day | Daily Mean<br>Barometer. | Temperature |      |      | Daily Mean<br>Humidity | Prevailing<br>Direction<br>of Wind | Velocity<br>Miles per Hour. | Daily<br>Precipitation * | GENERAL REMARKS  |
|-----|--------------------------|-------------|------|------|------------------------|------------------------------------|-----------------------------|--------------------------|--|
|     |                          | Max.        | Min. | Mean |                        |                                    | Maximum                     |                          |  |
| 1   | 29.86                    | 71          | 52   | 61.5 | 60 p. c.               | W. S. W.                           | 20                          | 0.00 in.                 | Mean Barometer, 30.00 inches.                                |
| 2   | 29.90                    | 72          | 48   | 60.0 | 64                     | S. W.                              | 10                          | 0.00                     | Highest Barometer, 30.88 inches on 28th.                     |
| 3   | 29.88                    | 73          | 53   | 63.0 | 91                     | Variable                           | 10                          | 0.01                     | Lowest Barometer, 29.11 inches on 10th.                      |
| 4   | 29.83                    | 77          | 58   | 67.5 | 87                     | S. W.                              | 15                          | 0.63                     | Monthly Range of Barometer, 1.21 inches.                     |
| 5   | 29.78                    | 64          | 55   | 59.5 | 89                     | W. S. W.                           | 25                          | 0.05                     | Mean Temperature, 55.2°                                      |
| 6   | 29.7                     | 65          | 47   | 56.0 | 68                     | N. W.                              | 20                          | 0.00                     | Highest Temperature, 73° on 31.                              |
| 7   | 29.7                     | 64          | 44   | 54.0 | 7                      | S. E.                              | 5                           | 0.0                      | Lowest Temperature, 37° on 10th.                             |
| 8   | 29.7                     | 65          | 44   | 54.5 | 80                     | N.                                 | 5                           | 0                        | Monthly Range of Temperature, 36°                            |
| 9   | 29.8                     | 63          | 50   | 56.5 | 64                     | N. W.                              | 5                           | 0.0                      | Least Daily Range of Temperature, 2° on 19th.                |
| 10  | 29.61                    | 65          | 41   | 53.0 | 54                     | W.                                 | 65                          | 1.25                     | Least Daily Range of Temperature, 4° on 22d.                 |
| 11  | 29.5                     | 66          | 41   | 53.5 | 54                     | S. W.                              | 40                          | 0.00                     | Mean Daily Range of Temperature, 14°                         |
| 12  | 29.5                     | 65          | 40   | 52.5 | 5                      | W. S. W.                           | 25                          | 0.00                     | Total Precipitation, 5.21 in.                                |
| 13  | 29.70                    | 67          | 50   | 58.5 | 5                      | S. S. E.                           | 1                           | 0.46                     | Mean Daily Relative Humidity, 74 per cent.                   |
| 14  | 29.70                    | 62          | 42   | 52.0 | 5                      | W.                                 | 15                          | 0                        | Prevailing Direction of Wind, S. W.                          |
| 15  | 29.75                    | 62          | 45   | 53.5 | 48                     | W.                                 | 30                          | 0.8                      | Number of Foggy Days, 0                                      |
| 16  | 29.80                    | 62          | 45   | 53.5 | 5                      | S. S. W.                           | 20                          | 0                        | Number of Clear Days, 14                                     |
| 17  | 29.80                    | 63          | 46   | 54.5 | 50                     | W. S. W.                           | 20                          | 0                        | Number of Fair Days, 10                                      |
| 18  | 29.8                     | 63          | 45   | 54.0 | 5                      | S. W.                              | 10                          | 0                        | Number of Cloudy Days, 8                                     |
| 19  | 29.75                    | 64          | 40   | 52.0 | 5                      | S. W.                              | 10                          | 0                        | Total Number of Days on which Rain or Snow Fell, 11.         |
| 20  | 29.74                    | 64          | 41   | 52.5 | 58                     | S. W.                              | 5                           | 0                        | Thunder Storm  |
| 21  | 29.8                     | 64          | 45   | 54.5 | 60                     | S. S. E.                           | 12                          | 0.00                     | Mean Max. Temperature, 63.5°                                 |
| 22  | 29.82                    | 66          | 45   | 55.5 | 84                     | N. E.                              | 12                          | 0.02                     | Mean Min. Temperature, 48.0°                                 |
| 23  | 29.8                     | 67          | 52   | 59.5 | 88                     | N. E.                              | 12                          | 0.07                     |  |
| 24  | 29.88                    | 65          | 51   | 58.0 | 90                     | N. E.                              | 20                          | 0.30                     |  |
| 25  | 29.8                     | 65          | 47   | 56.0 | 86                     | N. N. W.                           | 25                          | 0.77                     |  |
| 26  | 29.80                    | 65          | 49   | 57.0 | 87                     | N. N. E.                           | 24                          | 0.63                     |  |
| 27  | 29.81                    | 64          | 42   | 53.0 | 74                     | N.                                 | 8                           | 0.00                     |  |
| 28  | 29.86                    | 60          | 40   | 50.0 | 60                     | N. N. E.                           | 15                          | 0.8                      | October, 1892, had Mean Temperature of 54.2 degrees.         |
| 29  | 29.81                    | 60          | 50   | 55.0 | 60                     | N. N. E.                           | 20                          | 0.1                      | Max. 73.5 degrees, Min. 40.1 degrees. Precipitation 0.61 in. |
| 30  | 29.84                    | 64          | 55   | 59.5 | 80                     | N. N. E.                           | 12                          | 0.03                     | October, 1893, had Mean Temperature of 55.2 degrees.         |
| 31  | 29.77                    | 63          | 41   | 52.0 | 80                     | W.                                 | 35                          | 1.0                      | Max. 73.5 degrees, Min. 40.1 degrees. Precipitation 0.61 in. |
|     |                          |             |      |      |                        |                                    |                             |                          | <b>REMARKS.</b>  |
|     |                          |             |      |      |                        |                                    |                             |                          | October, 1892, had Mean Temperature of 54.2 degrees.         |
|     |                          |             |      |      |                        |                                    |                             |                          | Max. 73.5 degrees, Min. 40.1 degrees. Precipitation 0.61 in. |
|     |                          |             |      |      |                        |                                    |                             |                          | October, 1893, had Mean Temperature of 55.2 degrees.         |
|     |                          |             |      |      |                        |                                    |                             |                          | Max. 73.5 degrees, Min. 40.1 degrees. Precipitation 0.61 in. |

Average Temperature for two preceding years of  
\* Rain and Melted Snow

Average Precipitation for two preceding years

Total Trace of Precipitation

# Meteorological Observations taken at Newark, N. J., November 1894.

By PROF. G. C. SONN, VOL. OBSERVER, U. S. WEATHER BUREAU

| DATE. | Daily Mean<br>Barometer | Temperature |      |      | Daily Mean<br>Humidity | Direction<br>of Wind | Velocity<br>Miles per Hour |      | Daily<br>Precipitation* | GENERAL REMARKS                             |
|-------|-------------------------|-------------|------|------|------------------------|----------------------|----------------------------|------|-------------------------|---|
|       |                         | Max.        | Min. | Mean |                        |                      | Max.                       | Min. |                         |   |
| 1     | 30.08                   | 59          | 49   | 54.5 | 80                     | N. W.                | 10                         |      | 0.00                    | No. 46. Barometer, 30.14, in eve.           |
| 2     | 30.03                   | 41          | 12   | 26.5 | 80                     | S. W.                | 12                         |      | 0.00                    | Highest Barometer, 30.721 inches on 29th.   |
| 3     | 29.75                   | 41          | 49   | 55   | 80                     | W.                   | 1                          |      | 0.00                    | Lowest Barometer, 29.551 inches on 5th.     |
| 4     | 29.70                   | 50          | 41   | 45.5 | 80                     |                      | 0                          |      | 0.00                    | Monthly Range of Barometer, 1.17 inches.    |
| 5     | 30.00                   | 43          | 31   | 37   | 80                     | N. W.                | 10                         |      | 0.02                    | Mean Temperature, 46.1°.                    |
| 6     | 30.00                   | 41          | 31   | 36   | 80                     | N. W.                | 10                         |      | 0.02                    | Highest Temperature, 50° on 11th.           |
| 7     | 30.18                   | 58          | 41   | 49.5 | 80                     | N. W.                | 1                          |      | 0.00                    | Lowest Temperature, 24° on 28th, and 30th.  |
| 8     | 30.13                   | 50          | 31   | 40.5 | 80                     | N. W.                |                            |      | 0.00                    | Monthly Range of Temperature, 46°.          |
| 9     | 30.00                   | 51          | 31   | 41   | 80                     | N. W.                |                            |      | 0.00                    | Lowest Wind Force, 1 mile per hour on 11th. |
| 10    | 30.00                   | 41          | 30   | 35.5 | 80                     | W.                   | 75                         |      | 0.00                    | Lowest Temperature, 24° on 28th, and 30th.  |
| 11    | 30.08                   | 50          | 38   | 44   | 80                     | N. W.                |                            |      | 0.00                    | Mean Daily Range of Temperature, 5°.        |
| 12    | 30.00                   | 41          | 31   | 36   | 80                     | N. W.                |                            |      | 0.00                    | Total Precipitation, 3.68 in.               |
| 13    | 30.00                   | 41          | 31   | 36   | 80                     | N. W.                |                            |      | 0.00                    | Mean Daily Relative Humidity, 72 per cent.  |
| 14    | 30.00                   | 41          | 31   | 36   | 80                     | N. W.                |                            |      | 0.00                    | Prevailing Direction of Wind, W. S. W.      |
| 15    | 30.00                   | 41          | 31   | 36   | 80                     | N. W.                |                            |      | 0.00                    | Sum of Precipitation, 3.68 in.              |
| 16    | 30.00                   | 41          | 31   | 36   | 80                     | N. W.                |                            |      | 0.00                    | Sum of Precipitation, 3.68 in.              |
| 17    | 30.11                   | 50          | 41   | 45.5 | 80                     | N. W.                |                            |      | 0.00                    | Sum of Precipitation, 3.68 in.              |
| 18    | 30.11                   | 50          | 41   | 45.5 | 80                     | N. W.                |                            |      | 0.00                    | Sum of Precipitation, 3.68 in.              |
| 19    | 30.08                   | 50          | 41   | 45.5 | 80                     | N. W.                |                            |      | 0.00                    | Sum of Precipitation, 3.68 in.              |
| 20    | 30.08                   | 50          | 41   | 45.5 | 80                     | N. W.                |                            |      | 0.00                    | Sum of Precipitation, 3.68 in.              |
| 21    | 30.08                   | 50          | 41   | 45.5 | 80                     | N. W.                |                            |      | 0.00                    | Sum of Precipitation, 3.68 in.              |
| 22    | 30.08                   | 50          | 41   | 45.5 | 80                     | N. W.                |                            |      | 0.00                    | Sum of Precipitation, 3.68 in.              |
| 23    | 30.08                   | 50          | 41   | 45.5 | 80                     | N. W.                |                            |      | 0.00                    | Sum of Precipitation, 3.68 in.              |
| 24    | 30.08                   | 50          | 41   | 45.5 | 80                     | N. W.                |                            |      | 0.00                    | Sum of Precipitation, 3.68 in.              |
| 25    | 30.08                   | 50          | 41   | 45.5 | 80                     | N. W.                |                            |      | 0.00                    | Sum of Precipitation, 3.68 in.              |
| 26    | 30.08                   | 50          | 41   | 45.5 | 80                     | N. W.                |                            |      | 0.00                    | Sum of Precipitation, 3.68 in.              |
| 27    | 30.08                   | 50          | 41   | 45.5 | 80                     | N. W.                |                            |      | 0.00                    | Sum of Precipitation, 3.68 in.              |
| 28    | 30.08                   | 50          | 41   | 45.5 | 80                     | N. W.                |                            |      | 0.00                    | Sum of Precipitation, 3.68 in.              |
| 29    | 30.08                   | 50          | 41   | 45.5 | 80                     | N. W.                |                            |      | 0.00                    | Sum of Precipitation, 3.68 in.              |
| 30    | 30.08                   | 50          | 41   | 45.5 | 80                     | N. W.                |                            |      | 0.00                    | Sum of Precipitation, 3.68 in.              |

Total Means 30.08 45.2 34.1 40.1 71.8 p.c.

3.68 in.

Average Temperature for the month, 45.2° F.  
\* Rain and Melted Snow

Average Precipitation for two years previous, 4.17 in. Total snow, 1.2 in. melted.

## REMARKS.

First Snow in measurable quantity on 30th.

Partial Rain and Snow on 11th.

Meteorological observations taken at Newark, N. J., November 1894.

# Meteorological Observations taken at Newark, N. J., December 1894.

By PROF. G. C. SONN, VOL. OBSERVER, U. S. WEATHER BUREAU

| DATE        | Daily Mean<br>Barometer. | Temperature. |      |      | Daily Mean<br>Humidity. | Prevailing<br>Direction<br>of Wind | Velocity<br>Miles per Hour<br>Maximum. | Daily<br>Precipitation | GENERAL NOTES  |
|-------------|--------------------------|--------------|------|------|-------------------------|------------------------------------|--|------------------------|--|
|             |                          | Max.         | Min. | Me'n |                         |                                    |  |                        |  |
| 1           | 30.261                   | 35           | 32   | 33.5 | 80                      | S. W.                              | 12                                     | 0.04 in.               | Mean Barometer 30.14 inches.                         |
| 2           | 30.274                   | 40           | 33   | 36.5 | 74                      | N. W.                              | 12                                     |                        | Highest Barometer 30.93 inches on 23d.               |
| 3           | 30.282                   | 41           | 32   | 36.5 | 69                      | W. N. W.                           | 12                                     | 0.00                   | Lowest Barometer 29.210 on 27th.                     |
| 4           | 30.082                   | 42           | 28   | 35.0 | 69                      | W. S. W.                           | 12                                     | 0.00                   | Monthly Range of Barometer, 1.292 inches.            |
| 5           | 30.154                   | 37           | 27   | 32.0 | 67                      | W. S. W.                           | 10                                     | 0.00                   | Mean Temperature 37.0°                               |
| 6           | 30.132                   | 36           | 28   | 32.0 | 67                      | S. W.                              | 12                                     | 0.00                   | Highest Temperature on 15th and 17th                 |
| 7           | 30.174                   | 45           | 32   | 38.5 | 68                      | Variable                           | 10                                     | 0.00                   | Lowest Temperature on 29th                           |
| 8           | 30.051                   | 48           | 32   | 40.0 | 66                      | Variable                           | 10                                     | 0.57                   | Monthly Range of Temperature 48°                     |
| 9           | 30.052                   | 41           | 28   | 39.5 | 67                      | W.                                 | 10                                     | 0.00                   | Greatest Daily Range of Temperature 22° on 6th.      |
| 10          | 30.271                   | 37           | 32   | 34.5 | 74                      | N. E.                              | 20                                     | 0.00                   | Least Daily Range of Temperature 3° on 1st and 10th. |
| 11          | 30.276                   | 39           | 30   | 34.5 | 91                      | N. E.                              | 16                                     | 0.20                   | Mean Daily Range of Temperature 8°                   |
| 12          | 29.921                   | 32           | 28   | 30.0 | 88                      | W. N. W.                           | 20                                     | 0.00                   | Total Precipitation 1.66 in.                         |
| 13          | 29.956                   | 45           | 42   | 43.5 | 58                      | W.                                 | 50                                     | 0.00                   | Mean Daily Relative Humidity 72 per cent             |
| 14          | 30.175                   | 45           | 34   | 39.5 | 65                      | S. W.                              | 10                                     | 0.00                   | Prevailing Direction of Wind W. N. W.                |
| 15          | 30.137                   | 54           | 40   | 47.0 | 62                      | S. W.                              | 16                                     | 0.00                   | Number of Foggy Days, 0                              |
| 16          | 30.021                   | 50           | 35   | 43.0 | 72                      | S. W.                              | 12                                     | 0.00                   | Number of Clear Days, 11                             |
| 17          | 30.130                   | 54           | 40   | 47.0 | 61                      | N. W.                              | 24                                     | 0.00                   | Number of Fair Days, 4                               |
| 18          | 30.341                   | 42           | 34   | 38.0 | 43                      | N. W.                              | 30                                     | 0.00                   | Number of Cloudy Days, 4                             |
| 19          | 30.211                   | 48           | 29   | 38.5 | 72                      | S.                                 | 10                                     | 0.00                   | Total Number of Days on which Rain or Snow Fell, 12  |
| 20          | 30.026                   | 47           | 20   | 33.5 | 88                      | S. W.                              | 10                                     | 0.00                   | Thunder Storm  |
| 21          | 30.298                   | 41           | 30   | 35.5 | 70                      | N. W.                              | 10                                     | 0.00                   | Mean Maximum Temperature, 41°                        |
| 22          | 30.107                   | 51           | 34   | 42.5 | 61                      | N. W.                              | 20                                     | 0.04                   | Mean Minimum Temperature, 29.5°                      |
| 23          | 30.447                   | 51           | 23   | 37.0 | 64                      | W. N. W.                           | 12                                     | 0.00                   |  |
| 24          | 30.344                   | 35           | 19   | 27.5 | 71                      | Variable                           | 12                                     | 0.17                   |  |
| 25          | 30.036                   | 49           | 20   | 39.5 | 73                      | S. W.                              | 40                                     | 0.00                   |  |
| 26          | 30.338                   | 31           | 23   | 27.0 | 73                      | N. E.                              | 25                                     | 0.00                   |  |
| 27          | 30.690                   | 34           | 16   | 25.0 | 77                      | W. N. W.                           | 40                                     | 0.00                   |  |
| 28          | 30.154                   | 17           | 11   | 14.0 | 61                      | W. N. W.                           | 24                                     | 0.00                   |  |
| 29          | 30.123                   | 20           | 8    | 13.0 | 59                      | W.                                 | 24                                     | 0.00                   |  |
| 30          | 30.165                   | 27           | 15   | 21.0 | 64                      | S. W.                              | 12                                     | 0.00                   |  |
| 31          | 30.186                   | 32           | 24   | 28.0 | 65                      | W. N. W.                           | 12                                     | 0.00                   |  |
| Total Means |                          | 30.165       | 40.9 | 33.5 | 35.0                    | 72 p. c.                           |  | 4.61 in.               |  |

Average Temperature for two previous years of  
\* Rain and Melted Snow

Average Precipitation for two years previous, in.

in.

T indicates Trace of Precipitation

## REMARKS.

Total Snowfall for the month inches

## SUMMARY FOR 1894.

| MONTH     | MAXIMUM<br>TEMPERATURE | MINIMUM<br>TEMPERATURE | MEAN<br>TEMPERATURE | PRECIPITATION,<br>INCHES | SNOW,<br>INCHES |
|-----------|------------------------|------------------------|---------------------|--------------------------|-----------------|
| JANUARY   | 36                     | 12                     | 24                  | 1.2                      | 0               |
| FEBRUARY  | 36                     | 12                     | 24                  | 1.2                      | 0               |
| MARCH     | 36                     | 12                     | 24                  | 1.2                      | 0               |
| APRIL     | 36                     | 12                     | 24                  | 1.2                      | 0               |
| MAY       | 36                     | 12                     | 24                  | 1.2                      | 0               |
| JUNE      | 36                     | 12                     | 24                  | 1.2                      | 0               |
| JULY      | 36                     | 12                     | 24                  | 1.2                      | 0               |
| AUGUST    | 36                     | 12                     | 24                  | 1.2                      | 0               |
| SEPTEMBER | 36                     | 12                     | 24                  | 1.2                      | 0               |
| OCTOBER   | 36                     | 12                     | 24                  | 1.2                      | 0               |
| NOVEMBER  | 36                     | 12                     | 24                  | 1.2                      | 0               |
| DECEMBER  | 36                     | 12                     | 24                  | 1.2                      | 0               |

Total Precipitation, Rate and Melted Snow

Total Snowfall

Maximum Temperature for

Minimum

Mean

Range of Temperature

January, March, April, May, June, September, October and December were above normal in temperature, February and November below, while July and August were about normal.

The year's rainfall was short of the average by six inches. The following months were deficient—January, March, April, June, July and August.

GEO. C. SONN,

*Voluntary Observer U. S. Weather Bureau.*

## AREA OF CITY AND EXTENT OF PUBLIC IMPROVEMENTS.

|  |            |
|--|------------|
| Census population, 1890 .....  | 181,830    |
| Estimated population ..  | 203,923    |
| Total area of the city, square miles ..                                      | 18         |
| Built up portion, square miles...  | 12         |
| Meadow land, square miles .....  | 6          |
| Length of river and bay front, miles.....                                    | 10 5       |
| Number of miles of Stone block..   | 29 25      |
| Number of miles Telford pavement .....                                       | 10 94      |
| Number of miles of Cobble stone pavement ...                                 | 20 67      |
| Number of miles of Asphalt pavements in streets.                             | 4 18       |
| Total length of paved streets .....  | 65 04      |
| Number of miles of unpaved streets...  | 139 06     |
| Length of Electric Ra..ways, miles .....                                     | 50 00      |
| Length of Steam Railways, miles . ....                                       | 28 38      |
| Length of Brick Sewers, miles. ....  | 53 49      |
| Length of Pipes, Sewers, miles, . ....                                       | 58 55      |
| Total length of Sewers . ....  | 112 04     |
| Length of Water Mains, miles .....   | 204 08     |
| Average daily consumption of Water during the<br>month, gallons, about ..... | 18,000,000 |
| Capacity of Water supply, per day, gallons.....                              | 50,000 000 |
| Number of Buildings .....  | 26,928     |





---

---

# INDEX.

---

---





